NETWORK WORLD

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Novell offers central LAN control tool

By Caryn Gillooly
Senior Editor

PROVO, Utah — Novell, Inc. last week unveiled NetWare Services for OS/2, which comes with an application to help users centrally monitor and control their NetWare local-area networks.

The application, NetWare Management Map, runs on an OS/2 workstation and provides for physical management of LAN devices, logical management of software and historical analysis of LAN trends. It enables LAN administrators to view data through a graphical user interface that depicts a topological view of the entire LAN internetwork.

"There is an overwhelming need for this type of product in the market," said Frank Michnoff, program director at the META Group, a Westport, Conn.-based consultancy. "There needs to be a network management package tied closely to LANs, just as other packages [such as IBM's NetView] focus on wide-area networks."

NetWare Services for OS/2 contains two components. The NetWare Requester for OS/2 Version 2.0 is software that allows OS/2 workstations to access NetWare servers. For the first time,

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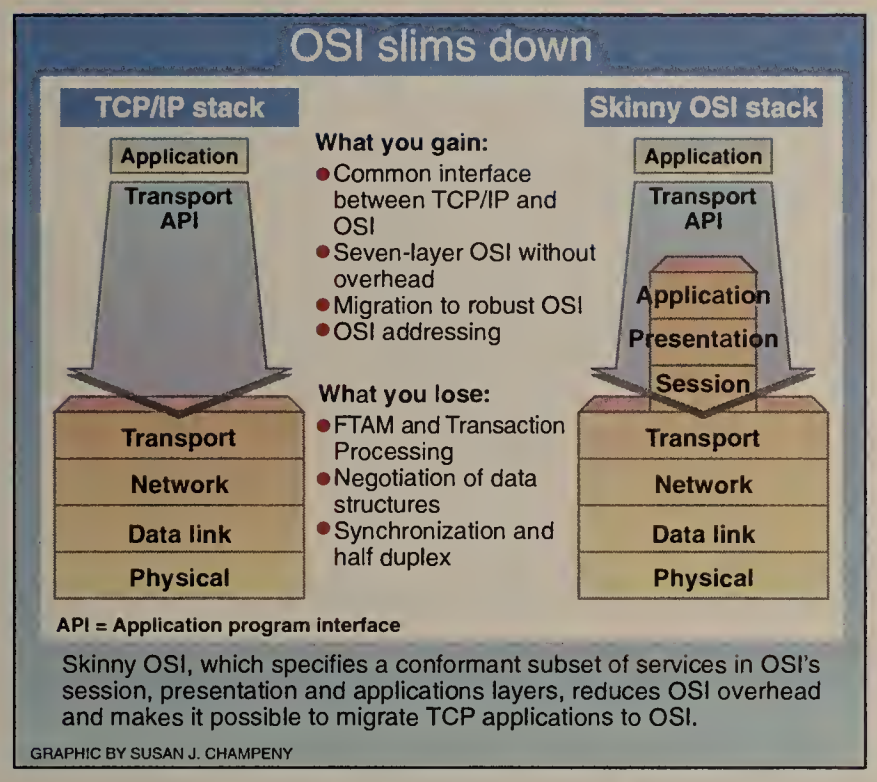

Skinny OSI, which specifies a conformant subset of services in OSI's session, presentation and applications layers, reduces OSI overhead and makes it possible to migrate TCP applications to OSI.

GRAPHIC BY SUSAN J. CHAMPENY

COS mulls skinny stack to convert TCP/IP users to OSI

By Wayne Eckerson
Senior Editor

The Corporation for Open Systems International (COS) is examining a proposal for a slimmed-down version of the seven-layer Open Systems Interconnection protocol stack that could make it easier for users to migrate from Transmission Control Protocol/Internet Protocol environments to OSI.

The so-called skinny stack specifies a narrow subset of OSI Layers 5, 6 and 7 — the session, presentation and application layers — that can run on top of TCP or OSI transport layers.

By stripping out most of the functionality in the top three layers, the skinny stack duplicates the functionality of TCP/IP without adding much overhead. It also should let users run TCP/IP applications over OSI using common transport-layer application program interfaces (API), obviating the need for users to make complex coding changes.

"Skinny stack is a key technology that will help users migrate from the TCP world to OSI," according to Bill Biagi, director

(continued on page 8)

Firm trials SMDS for T-3 network access

Company that manages the NSFNET teams with RBHCs to test net interoperability, performance.

By Bob Wallace
Senior Editor

ELMSFORD, N.Y. — Advanced Network & Services, Inc. (ANS) has teamed with two regional Bell holding companies to trial Switched Multimegabit Data Service (SMDS) as a low-cost alternative to dedicated links for accessing its nationwide T-3 backbone net.

Analysts hailed the project as a milestone in the evolution of SMDS and said it could speed RBHC deployment of the service as well as dramatically broaden user demand.

"It takes a project like this to demonstrate to users that SMDS is more than just another RBHC island service," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "This effort underscores the fact that the RBHCs are committed to working together to get these services out soon."

ANS is a nonprofit company founded by IBM, MCI Communications Corp. and Merit, Inc. to manage the National Science Foundation Network, which is under contract to Merit. It is working with Nynex Corp. and Pacific Bell on the SMDS trial.

"Phone companies charge users a flat monthly fee for dedicated lines, but SMDS will likely be priced solely on usage," said Jordan Becker, ANS' vice-president of network services. "We see

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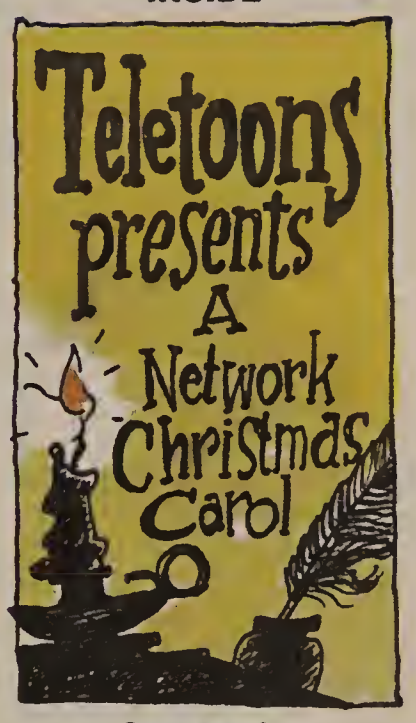
INSIDE



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Proteon to air high-end wiring hub

By Bob Brown
Senior Editor

WESTBOROUGH, Mass. — Proteon, Inc. next month will invade the intelligent wiring hub market with a quad-bus concentrator designed to support both token-ring and Ethernet local-area networks, *Network World* has learned.

Proteon's Series 90 Intelligent Network Concentrator will support a range of wiring types, a routing module and redundant power supplies. The hub, already in low-volume production and shipping to key customers, was designed to support Fiber Distributed Data Interface nets in the future.

Proteon designed the Series

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NETLINE

FCC BLOCKS BIG CHANGES to Tariff 12 deals, raising concern among users. Page 4.

TOKEN-RING SUPPORT for front-end processor gives Unisys mainframes new SNA connectivity options. Page 4.

WANG IS REPORTEDLY unloading its Wangpac international X.25 packet network. Page 4.

NEW ETHERNET MODULES give Cabletron, SynOptics users more cabling options, extend hub-to-node distances. Page 4.

SOUTHWESTERN BELL plans switch upgrade to prep for CLASS, ISDN and frame relay services. Page 4.

CARRIER ACCUSES NSF of setting up monopoly on the Internet. Page 6.

NEWSPAPER

FEATURE

New modeling tools help in building LAN internets

By Patricia Cope
Special to Network World

Designing a network of interconnected LANs on the back of an envelope just isn't possible anymore — if it ever really was. Nor can users with existing internetworks expect to solve congestion problems by simply adding more bridges, routers and circuits to their networks.

So forward-thinking users are looking for tools to help them design and optimize their networks. In fact, network designers and managers want tools that are as easy to use as spreadsheets.

Such tools are starting to emerge for the local-area network interconnect market but are, so far, difficult to use. They were adapted from products that had their origins in wide-area network design and optimization. The tools are intended to model and simulate network behavior, enabling users to create what-if scenarios that let them compare LAN interconnect design alternatives, plan for network capacity changes and predict perfor-

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IBM board to support both Token-Ring, Ethernet LANs

Big Blue is also expected to license its Token-Ring chipset technology to National Semiconductor.

By Jim Duffy
Senior Editor

ARMONK, N.Y. — IBM is developing a multifunction adapter card that will connect Industry Standard Architecture (ISA)- and Micro Channel Architecture (MCA)-based microcomputers to IBM Token-Ring Network and Ethernet local-area nets.

The multifunction LAN adapter will enable users to link a workstation to an Ethernet and a token ring without incurring added expense for separate adapters or consuming a second microcomputer bus expansion slot.

IBM is also expected to announce early next year a licensing agreement that will enable National Semiconductor Corp. to manufacture IBM's Token-Ring chipset and market it to circuit board makers and systems vendors. The licensing deal means users will eventually be able to purchase token-ring products from board suppliers other than IBM with the confidence that those offerings are fully IBM-compatible, observers said.

An IBM spokeswoman would neither confirm nor deny the reports, which came from a source within the industry giant.

The LAN interface, which some observers said could be announced as soon as February, will slide into a single slot on an ISA

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Standards-based products, net mgmt. top holiday lists

Users want products that live up to vendor hype.

By Joanne Cummings
Staff Writer

Truly centralized network management and standards-based products are among the most coveted items that network managers hope to find under their Christmas trees this year.

"I would like to see a centralized approach to network management," said Mark Johnson, data communications manager at Liberty Brokerage, Inc. in Washington, D.C. "Today, there is no one vendor that has a grip on something between LANs and WANs. Everybody claims they do, but no one really does."

Ronald West, manager of telecommunications and office automation at Shearman & Sterling in New York, said he would like a "truly cost-effective management tool.

"Things like [AT&T's] Accumaster Integrator cost a phenomenal fee to buy in," he said. "I'd like Santa to bring me some reasonableness in the fee structure associated with buying network management."

Andrew Block, senior data systems manager at Lockheed Corp. Missiles & Space Division in Sunnyvale, Calif., was more detailed in his net management wish. "I would like a network management system that does both continuous diagnostics and

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Tandem pushing NonStop device as database server

By Jim Duffy
Senior Editor

CUPERTINO, Calif. — Tandem Computers, Inc. last week unveiled new products and partnerships to bolster the ability of its NonStop processors to function as database servers for PCs and workstations in a client/server environment.

The company also promised to deliver a product, based on specifications developed by the SQL Access Group, that would allow front-end SQL applications on client workstations to access SQL databases on NonStop machines. The SQL Access Group was founded in 1989 to define and implement specifications for heterogeneous SQL data access. Tandem declined to say when that product will emerge.

The announcements are part of Tandem's strategy to integrate personal computers and workstations into on-line transaction processing (OLTP) environments supported by its NonStop SQL relational database management system.

"They're looking at supporting standard front ends that can work with Tandem systems as back ends," said Dave Passmore,

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Briefs

IBM stages frame relay tests. The IBM Information Network (IIN) this month commenced frame relay tests that are slated to conclude by March, according to David Kamm, senior product manager for network services and advanced technologies with the IIN in Tampa, Fla.

In the tests, the IIN is using WilTel's WilPak public frame relay service to carry Systems Network Architecture traffic between front-end processors equipped with IBM's frame relay interface at locations in Dallas, Tampa and White Plains, N.Y. Kamm said the tests are designed to work out the kinks in transporting SNA traffic over frame relay.

AT&T interested in U.K. carrier? Two London newspapers, *The Times* and *The Daily Telegraph,* last week reported that AT&T is talking with Cable & Wireless PLC about buying a stake in Mercury Communications, Ltd., the U.K.'s second largest carrier. Neither newspaper disclosed their sources, and both AT&T and Cable & Wireless declined comment. But analysts said Cable & Wireless is interested in selling a stake in Mercury Communications to bolster Cable & Wireless' stock price. AT&T officials have said publicly that they want to expand operations in Europe through alliances with local carrier.

TI's EDI program suffers setback. Texas Instruments, Inc.'s electronic data interchange program suffered a major blow last month when its top two EDI managers, Ken Shoquist and Mark Payne, resigned unexpectedly. The loss of the two, who hold leadership positions in several EDI organizations, came just as TI began marketing several internally developed EDI products to external customers. Those products included a communications gateway, translation software and a mapping program. Shoquist and Payne said they left TI because a recent company restructuring minimized their chances for advancement.

Codex moves to cut work force. Motorola Codex last week said it has implemented a voluntary resignation program to reduce U.S. and Canadian staffing levels. A spokesman attributed the cost-cutting measures to the soft market. Employees had until Dec. 17 to sign up for the program.

Intel to offer LAN virus killer. In the first quarter of next year, Intel Corp. is expected to introduce a local-area network server-based antivirus product called LAN Rx. The product is designed by Trend Micro Devices, Inc., which sells PC Rx, the personal computer version of the software. Like PC Rx, LAN Rx will detect viruses by investigating changes in file lengths and other network conditions. It reportedly will let individual LAN users download the software to check files on their PCs or enable administrators to do remote virus checking from a central location.

OSF elects new chairman. The Open Software Foundation, Inc. in Cambridge, Mass., last week elected Mike Saranga as its chairman. Saranga is the assistant general manager of systems structure and management for IBM Programming Systems. He replaces interim Chairman Peter Schneider, an IBM vice-president and assistant general manager of manufacturing and development.

FCC sets ONA guidelines. The Federal Communications Commission last week issued an order establishing new technical and tariff reporting requirements for the Bell operating companies under the FCC's Open Network Architecture (ONA) plan. The FCC directed the BOCs to file annual reports beginning April 15. The reports will detail the carriers' three-year ONA deployment schedules, ONA service requests and the basic service elements they use for their enhanced services, as well as the deployment of Integrated Services Digital Network, Signaling System 7 and other new offerings.

Cabletron revenue climbs. Cabletron Systems, Inc. last week posted third-quarter revenue of $78 million, up 62% from the same quarter last year. Earnings rose 63% from $9.4 million to $15.3 million.

In a separate action, Cabletron Chairman Craig Benson acknowledged that the company is considering repackaging its Spectrum net management package to appeal to a broader audience. The company may sell the product piecemeal so users can buy only the components they need. The move that would let Cabletron lower the product's price, which sells for between $50,000 and $150,000.

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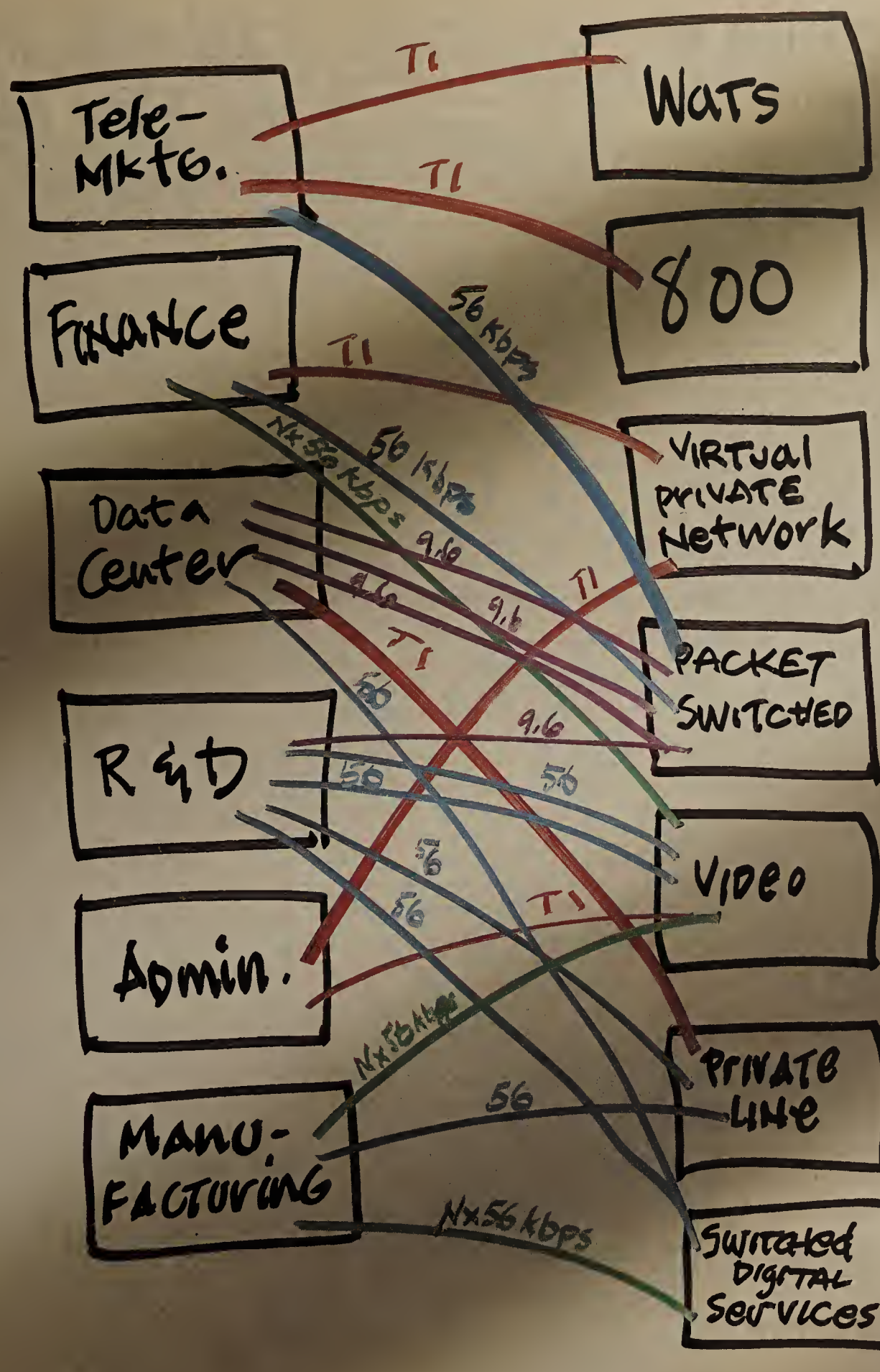

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FCC squelches revision of two of AT&T's Tariff 12s

Action heightens fears among other AT&T users.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC last week refused to allow AT&T to make major changes to two Tariff 12s, raising fears that other users will not be able to modify their deals in the future.

Separately, AT&T got some breathing room for its Tariff 15 deals, which appeared legally doomed. A federal appeals court issued a stay preventing the Federal Communications Commission from throwing out Tariff 15s until the court reviews the order barring them.

In its ruling last week, the FCC rejected revisions to a Tariff 12 deal for Metropolitan Life Insurance Co. that included reducing basic charges, changing charges for adding or dropping services and revamping volume discounts for international service.

It also rejected changes for Litton Industries' deal that included adding measured ports and rates for measured ports, reducing the basic charge and adding a discount for data lines.

The agency allowed revisions for MasterCard International, Inc. and an unnamed Option 86 user. The FCC said it viewed those revisions as minor changes that resolved nagging problems, such as omission of price information.

Currently, there are revisions pending for 10 more Tariff 12 deals, and the agency apparently intends to review each change on a case-by-case basis.

The moves indicate that Tariff 12 users may run into major problems — or at least bureaucratic delays — in trying to adjust their networks to changing business conditions. The agency can take up to 120 days to review changes or longer if there are legal question about the change.

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Unisys upgrades CP2000 with token-ring module

By Paul Desmond
Senior Editor

BLUE BELL, Pa. — Unisys Corp. last week announced an enhanced module for its CP2000 front-end processor that enables the company's A and V Series mainframes to communicate over token-ring networks.

The vendor also announced the MACP100, a communications board that allows the low-end Unisys Micro A Series mainframes to be configured as Systems Network Architecture PU Type 2 or PU 2.1 nodes. The board represents the first native SNA support for the A Series.

The new token-ring support for the CP2000 was made possible by enhancing the company's existing IEEE 802.3 Ethernet CP2000 line module to support communications with token-ring local-area networks via a bridge, according to Ralph Farina, department manager for Unisys CP2000, A and V Series SNA interconnect products.

The LAN support will complement an existing wide-area network module that enables the CP2000 to emulate PU 2 and PU 5 devices when communicating via Synchronous Data Link Control and X.25 links at a maximum speed of 64K bit/sec, he said.

Unisys has certified the enhanced Ethernet line module to work with the IBM 8209 bridge, which connects Ethernets to 4M and 16M bit/sec token-ring LANs.

"Instead of doing token-ring module development for the CP2000, we opted for the bridge in order to get something quickly to market with LAN-speed access," Farina said.

World Bank in New York, a beta user of the enhanced Ethernet module, is using it to connect two Ethernet-attached A Series mainframes to a token ring. The token ring supports an IBM 3745 front-end processor linked to an IBM 3090 mainframe. Addition-

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Wang allegedly selling X.25 net to Cable & Wireless

Deal for int'l packet net no surprise to analysts.

By Barton Crockett
Senior Editor

LOWELL, Mass. — Wang Laboratories, Inc. is reportedly selling its Wangpac international X.25 packet network to Cable & Wireless PLC, according to a user briefed by Wang officials.

The user, who requested anonymity, last week said Wang officials told him the sale has been finalized. The user manages network services for a large services company in the Northeast that has used X.25 transport services from Wangpac since the mid-1980s to link remote terminals in about 60 U.S. locations to a Wang minicomputer at a major operations center.

Neither Cable & Wireless nor Wang officials would confirm or deny the report. But the user's statement falls in line with comments from analysts who said Wang has been looking to offload Wangpac in order to reduce debt and improve profitability.

Berge Ayvazian, vice-president for communications research at The Yankee Group, a network consultancy in Boston, said Wang has been looking to sell Wangpac for several months. Ayvazian's firm helped a handful of prospective buyers evaluate the network. Although he declined to name them, he noted that Cable & Wireless was not among those companies and none of the prospective buyers decided to purchase Wangpac.

But Ayvazian and other analysts said they would not be surprised if Cable & Wireless bought Wangpac because that firm could use such a deal to move toward its strategic goal of increasing its packet switching business.

Mark Winther, vice-president at Link Resources Corp., a New York network consultancy, said Cable & Wireless Communications, Inc., a U.S. carrier owned by Cable & Wireless PLC, could use Wangpac to expand its U.S. presence. Cable & Wireless Communications currently offers X.25 service from Northern Telecom, Inc. packet switches in seven U.S. cities.

Winther said Wangpac only has 80 to 100 customers — primarily law firms and other Wang minicomputer users. He estimated that about 90% of Wangpac's traffic is generated by Wang.

He said Wangpac is a sizable network, based on about 50 Bolt Beranek and Newman, Inc. (BB&N) packet switches and Telematics International, Inc. packet assembler/disassemblers in 70 U.S. sites, as well as in Australia, Belgium, France, Germany, Hong Kong, Ireland, the Netherlands, Singapore, Spain, Sweden, Taiwan and the U.K.

Equipment compatibility problems could hamper the performance of links between the BB&N- and Northern Telecom-based networks.

Analysts also said Wangpac could benefit by breaking away from its troubled parent. "The whole world knows Wang is in bad shape, and that taints Wangpac," Winther said.

Cabletron, SynOptics roll out E-net cable modules

By Maureen Molloy
Staff Writer

Wiring hub vendors Cabletron Systems, Inc. and SynOptics Communications, Inc. last week separately announced Ethernet modules that will enable users to employ a wider variety of cable types as well as extend the distance between their hubs and attached nodes.

Cabletron announced three new single-mode fiber-optic Ethernet modules for its Multi Media Access Center (MMAC) series of smart hubs, which will enable users with campuswide networks to deploy single-mode fiber cabling to support cable runs as far as six miles between MMAC hubs, or between the hub and end nodes.

The new Fiber Optic Media Interface Modules (FOMIM) are the FOMIM-38, 32 and 36, which provide connectivity for as many as 18, 12 and six nodes, respectively. The modules fit into an MMAC chassis, allowing devices connected to one module to communicate over the hub's bus with local-area network devices attached to another.

According to Chris Oliver, Cabletron's director of engineering and manufacturing, the fiber modules can be upgraded to support the 1G bit/sec transmission speed that Synchronous Optical Network (SONET)-based products are expected to eventually support.

"With single-mode fiber being deployed as the media of choice by the telephone companies, customers are looking for products that will provide a migration path to evolving technologies such as SONET," Oliver said.

The company also introduced the FOT-F3, a fiber-optic transceiver for connecting devices to single-mode fiber Ethernet LANs. It is equipped with two ST connectors and a DB15 attachment unit interface connector, which enable Ethernet devices — such as repeaters, multiport transceivers and bridges — to be linked to

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Southwestern Bell readies extensive switch upgrade

Will speed deployment of ISDN and frame relay.

By Bob Wallace
Senior Editor

ST. LOUIS — Southwestern Bell Telephone Co. last week said it will upgrade 145 of its Northern Telecom, Inc. DMS-100 central office switches to hasten deployment of Custom Local Area Signaling Service (CLASS), ISDN and frame relay.

> "With emergence of National ISDN 1, we expect demand for ISDN to increase."
>
> ▲▲▲

At a cost of about $130 million, Southwestern Bell Telephone will upgrade the DMS-100s to DMS-SuperNodes by swapping out software and processors. The upgrade will allow the switches to handle more call attempts and support advanced services.

Southwestern Bell Telephone said the switch upgrades will enable it to begin offering frame relay service in some parts of its five-state territory next year and throughout its region in 1993 but declined to provide specific rollout plans for other services.

Jim Brown, vice-president of marketing for Northern Telecom's Southwest sales group, said the Bell operating company will need the extra processing power of the DMS-SuperNode if demand for CLASS, Integrated Services Digital Network and central office-based automatic call distribution services increases.

National ISDN 1

"Demand for ISDN right now is relatively small," Brown said. "But with emergence of National ISDN 1, we expect demand for ISDN to increase considerably."

National ISDN 1 is a set of Bell Communications Research technical references that standardize customer premises equipment-to-switch and interswitch communications.

Southwestern Bell Telephone's current switches do not support National ISDN 1, and the company did not stipulate National ISDN 1 support as a purchase criterion, said Dave Signagio, switched services technical planning area manager for the BOC.

The DMS-100 switches that are to be upgraded currently support more than two million lines — one sixth of the BOC's access lines — in five states: Arkansas,

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NSF, ANS charged with Internet abuse

RESTON, Va. — Performance Systems International, Inc. (PSI) last week accused the National Science Foundation (NSF) and Advanced Network & Services, Inc. (ANS) of stifling competition for commercial Internet services.

William Schrader, president and chief executive officer of PSI, a regional Internet carrier that operates the T-1 PSINet, messaged members of the Internet privatization/commercialization discussion group alleging that NSF has positioned ANS as the monopoly carrier for Internet commercial traffic.

Schrader wrote that, by allowing the nonprofit ANS to form a for-profit subsidiary to sell Internet services, NSF "changed the rules of the game in midplay." The effect, Schrader alleged, would be "a monopoly positioning of ANS." PSI offers commercial net services in conjunction with two other regional Internet carriers.

ANS, a company founded by IBM, MCI Communications Corp. and Merit, Inc., manages the NSF Network (NSFNET) backbone under contract to Merit. NSFNET, which is funded by the NSF, is based on T-3 services supplied by ANS.

Federal "appropriate-use" restrictions allow only research data to be sent across NSFNET. Last spring, however, ANS got government permission to set up the for-profit ANS CO+RE Services to sell commercial users excess capacity on the ANS T-3 backbone, providing that the profits were poured back into the network.

But Schrader said ANS is pressing the regional Internet providers to sign a commercial-data agreement that is unfair. Under ANS' commercial-use contract, regional carriers are asked to agree to accept commercial traffic from ANS for free. But if the network provider wants to send traffic back across ANS, a charge is leveled on the provider.

PSI's Schrader wants ANS to join the Commercial Internet Exchange (CIX), a gateway set up by PSI and two other regional Internet carriers to support commercial traffic by circumventing the NSFNET backbone.

Schrader said the addition of ANS to CIX would create a level playing field in the commercial services provision on the Internet. ANS is considering joining CIX but has not yet reached a decision.

— Ellen Messmer

Products top holiday lists

continued from page 2

network management, and I'd like it to do it remotely from a central console," he said.

Standards-based products are another hot item on network managers' wish lists this year. "I'd like true standards-based products and services, particularly with regard to wide-area and local-area networking, so everything required from the desk through the outermost aspect of the network would be able to talk to everything else," West said.

Michael Kilbane, general manager of systems development at Diamond Shamrock Refining & Marketing Co. in San Antonio, Texas, echoed that sentiment. "I would like Santa to have all vendors of network products truly embrace the open standards issue so we could get true conformance in products," he said.

Another area where Santa could be of some help to users is in providing more competition in the local loop in the coming year. "We are glad Metropolitan Fiber [Systems, Inc.] and Teleport [Communications Group] are out there, but they're not in the majority of the cities in the U.S. yet. It's still very narrow," said Brian Moir, counsel for the International Communications Association.

Bryce Morgan, network manager at Union Carbide Corp., is eagerly awaiting the arrival of IBM's latest version of OS/2. "I'd like OS/2 Version 2.0 — one that really works," he said. "We've been working with the beta version, and it's still pretty big and a little slow. I think that once [IBM] gets the bugs worked out, it'll be a great product."

Robert Hamilton, information technology engineer at Hewlett-Packard Co., wants vendors to live up to their promises. "What I'd like is to have all of the fantastic things that vendors say products and services can do to be true," he said. "A lot of times, you have to stand on your head to get things to actually work. I'd like it to just plug in and work the way they hype it."

Tandem pushing NonStop device

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a partner at Ernst & Young in Vienna, Va. "They're doing everything they can to not be viewed as a proprietary systems [vendor]."

Among last week's announcements, the company unveiled Tandem SQL Server Gateway software, which enables client applications designed to work with Sybase, Inc. and Microsoft Corp. SQL Server to access NonStop SQL.

Tandem, through its Application Development Solution Partners program, has already lined up a number of software vendors that will develop versions of popular client-based applications to work with its SQL Server Gateway. The vendors include Borland International, Inc., Microsoft, Neuron Data, SQ Software, Inc. and JYACC.

The software includes Borland's Paradox SQL Link and Paradox 3.5, Microsoft's Excel 3.0, SQ's SQR-Structured Query Report Writer, Neuron's Nexpert Object and JYACC's Jam.

The Tandem SQL Server Gateway is available from Tandem and runs on all NonStop systems. The standard monthly license fee starts at $190, and a onetime license charge starts at $4,940.

Tandem also announced that Oracle Corp. has developed versions of its SQL*Connect gateway and SQL*Net networking software to link Tandem SQL and Oracle databases. SQL*Connect and SQL*Net for Tandem systems are available now from Oracle.

Pricing for SQL*Connect and SQL*Net starts at $7,000 and $4,900, respectively.

Tandem also brought out Remote Server Call (RSC) software, based on technology from Cornerstone Software, Inc. RSC is an application program interface that lets DOS and OS/2 applications access data on NonStop systems.

RSC software is available now from Tandem to run on all NonStop systems. The standard monthly license fee for RSC host software starts at $190 with a onetime license charge starting at $6,815. For workstation-resident RSC software, the standard monthly license fee starts at $65 and a onetime license charge starts at $2,315.

Tandem has also entered into a development and joint marketing agreement with Annatek Systems, Inc., a maker of distributed PC management products, to develop software for managing workstations in a client/server OLTP environment.

Annatek will convert its Network Navigator products to run on NonStop systems. These products handle software distribution, data distribution and collection, and inventory and asset management for MS-DOS, Microsoft Windows and OS/2 workstations connected to NonStop systems through a local-area network. Network Navigator for NonStop systems will be released in mid-1992, according to Annatek.

Firm trials SMDS project

continued from page 1

SMDS as a potentially affordable, high-bandwidth access alternative for users that don't need to be on the network all the time."

ANS said the trial is the first in which SMDS will be used to link local-area networks based on the Transmission Control Protocol to a backbone network based on the Internet Protocol.

The company embarked on the trial to research the trade-off of using SMDS in place of dedicated lines to bring sites into its wide-area network.

"Our goal is to learn about routing issues and evaluate performance of running IP traffic over SMDS, as opposed to leased lines," Becker said. "We also want to explore the network management and accounting areas."

Ittai Hershman, ANS' technical services manager, said the company is concerned about how performance may be affected by using SMDS to carry data into its T-3 backbone.

"With dedicated leased lines, we had control of the route used to carry traffic between any two points," Hershman said. "With SMDS, the RBHC tells customers not to worry about what's going on in the cloud. We lose control of the routing of data." He hopes to identify performance issues in the trial.

"We're sure there are performance issues, but we're not yet sure what they are," Hershman said. "The only way to find out is to test the service." The trial began last week and will run until mid-May.

Net setup

In the trial, a router on an Ethernet LAN located in a Pacific Bell research laboratory in San Ramon, Calif., forwards traffic over a dedicated T-1 to a local SMDS switch. The traffic is carried over switched T-1 links in the SMDS net to a router at an ANS site in San Francisco, which has access to the T-3 backbone net.

The T-3 backbone sends traffic to an ANS site here. A router passes it over a dedicated T-1 to an SMDS switch in White Plains, N.Y. The traffic is then carried over switched T-1 links in the SMDS network to a dedicated T-1 and finally to a router on an Ethernet in a Nynex research lab.

ANS, Pacific Bell and Nynex will only link Ethernet LANs during the trial.

Hershman said ANS hopes to determine what impact this process will have on the performance of the network as compared to leased lines. "We want to study the speed, delay and latency of end-to-end traffic," he added.

ANS thinks SMDS may be a less expensive way for users to access its T-3 backbone network. But the company cannot yet determine when it is more economical to use SMDS.

"The RBHCs have said SMDS will cost less than leased lines, but that's all," Hershman said. "We won't know where it makes more sense to use SMDS for access until the RBHCs tariff the service."

SMDS evaluation

ANS is also trying to determine how to manage the test network, which is difficult because it is made up of switched local access connections and dedicated backbone links, Becker said.

ANS uses a series of Simple Network Management Protocol-based network management tools to centrally manage the network from a facility in Ann Arbor, Mich. It would like to continue to use these tools with the test net but may need to make modifications to accommodate the additional management information, such as packet error rates, and an ongoing reading of aggregate bandwidth available, Becker said.

ANS said that if the trial goes well and inter-local access and transport area SMDS becomes available, it would seriously consider using the service to replace some dedicated links in its T-3 backbone network.

FCC squelches deal revision

continued from page 4

AT&T issued a statement last week saying, "The implications of the [FCC's] action are not clear. But any ruling that would prevent customers from getting what they need from AT&T when their business needs change does not help at all."

Henry Levine, a Washington, D.C. attorney who has helped users negotiate Tariff 12s, said the decision will cause problems for users. For example, provisions in some deals allowing ongoing rate adjustments may be judged as too major a change for the FCC.

Problems with revisions stem from an Aug. 1 ruling by the FCC that states AT&T is still dominant in the 800 services market. AT&T was banned from including 800 service in any new Tariff 12, and the agency indicated it would not allow changes to existing deals that include 800 service.

The FCC was deeply divided on allowing changes. It doesn't want to interfere with customers' ability to get services they need, but if it were to backtrack on barring changes, its credibility would be seriously undermined.

Congress has also pressured the FCC. Reps. Edward Markey (D-Mass.) and Michael Oxley (R-Ohio) wrote to FCC Chairman Alfred Sikes this month, saying they were "deeply troubled" that the FCC was considering allowing changes in Tariff 12 deals.

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"The PC superserver market has been hampered by the late arrival of client/server software and the small size of existing LANs. However, this is rapidly changing."

William Bluestein
Senior analyst
Forrester Research, Inc.
Cambridge, Mass.

People & Positions

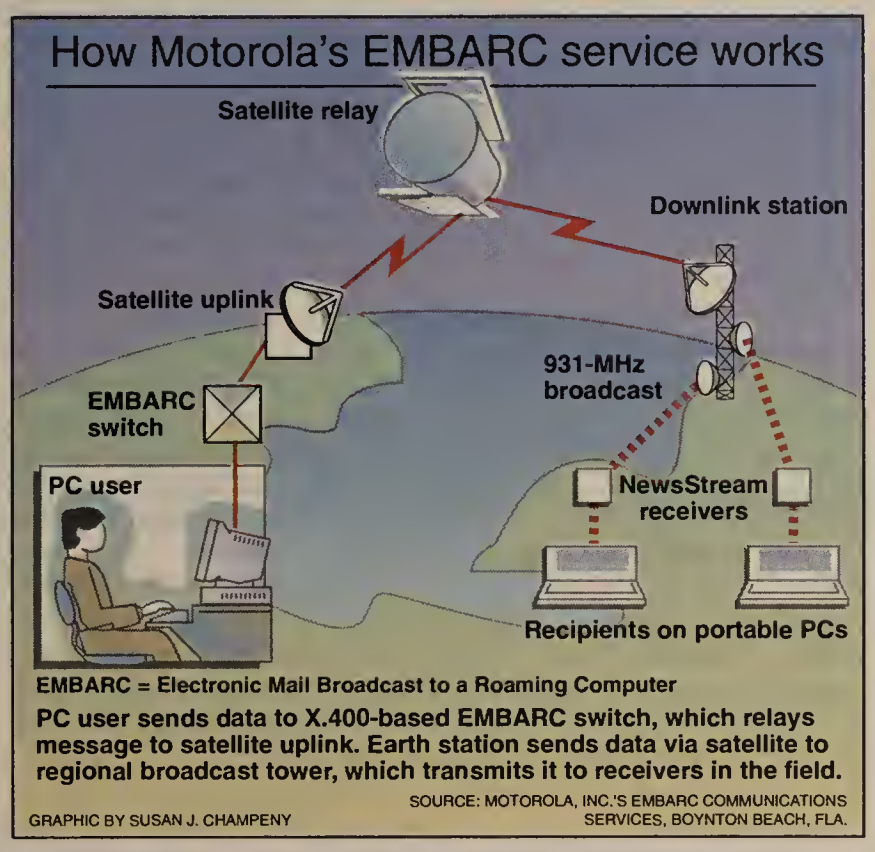
MCI Communications Corp. last week announced that **William McGowan** is stepping down as chief executive officer and **Bert Roberts Jr.**, MCI's president and chief operating officer, will assume the CEO post.

McGowan will remain as MCI's chairman, although Roberts will now handle the company's strategic planning. McGowan, the founder of MCI, said his recommendation of Roberts to the board was part of a management transition that began with Roberts' election as president in 1985.

Wellfleet Communications, Inc. last week appointed **Gary Geaslan** to the post of vice-president for customer support.

Geaslan will be responsible for managing Wellfleet's corporate consulting, systems engineering and customer support organizations. Previously, he was vice-president of customer support at Mentor Graphics Corp.

AT&T last week announced that **Frank Blount,** group president of communications products, plans to leave the company on Jan. 8 to become chief executive officer of **Australian and Overseas Telecommunications Corp. (AOTC).** AOTC is a newly created company resulting from the merger of Australia's principal telephone companies.



Motorola to enter services mart via one-way E-mail

New radio service targeted at users on the go.

By Ellen Messmer
Washington Correspondent

BOYNTON BEACH, Fla. — Motorola, Inc. this February plans to unveil its first nationwide one-way wireless electronic mail service, marking the company's debut as a public data service provider.

Motorola's Electronic Mail Broadcast to a Roaming Computer (EMBARC) service will provide one-way delivery of E-mail messages to users in the field with laptop computers that have radio receivers.

Such a service, Motorola contends, will be pivotal in helping companies relay messages to sales staff, field service engineers and other employees on the move.

But analysts said one-way transmission services will remain a niche technology destined to be outclassed by the wave of two-way wireless transmission services expected to hit the market soon.

Ira Brodsky, president of Wilmette, Ill.-based Datacomm Research Co., pointed out that two-way E-mail services are being introduced by RAM Mobile Data, Inc. and Anterior Technologies, Inc.

EMBARC will provide one-way delivery of as many as 1,500 characters per message to users of any MS-DOS-based personal computer outfitted with a Motorola RS-232-compatible NewsStream radio receiver. Users of the service will be able to receive messages from any public or private E-mail system with an X.400 gateway.

EMBARC is a one-way service because it is delivered via a dedicated 931-MHz nationwide paging frequency formerly used by paging service provider Contemporary Communications, Inc., which Motorola purchased last year for its valuable spectrum property.

E-mail users with access to an X.400 gateway can send messages to EMBARC subscribers using a carrier's E-mail service to route the message to an EMBARC switch. An X.400-based EMBARC switch receives a message, stores it and transmits it to a satellite uplink. The uplink then hands the signal to a communications satellite, relaying it to one or more regional sites.

The downlink station receives the signal and broadcasts it at 931 MHz to the NewsStream one-way radio receiver.

The EMBARC wireless service costs $15 per month per subscriber for unlimited transmission. The NewsStream receiver with the RS-232 connection costs $395. That price includes the EMBARC software for the MS-DOS-based computer.

Usage is billed to the sender, not the user. These charges, which will appear on the E-mail sender's bill from the public E-mail provider, will vary accordingly to the priority of delivery.

Motorola plans to institute a radio delivery surcharge of 13 cents per message. An additional priority charge will range from 50 cents per 100 characters for immediate delivery to 5 cents per 100 characters for overnight delivery.

IBM gets nod to run Quotron financial net

IBM will manage T-1 backbone net that carries financial services data, handles customer support.

By Wayne Eckerson
Senior Editor

NEW YORK — In an effort to slash costs, Quotron Systems, Inc. recently signed a five-year deal with IBM for hardware, network services and customer support.

Under the deal, IBM will manage Quotron's nationwide backbone network, which is used to transmit on-line financial information, such as stock, option and commodity quotes, foreign exchange and fixed income rate data, as well as research and other information to Quotron's more than 5,000 customers.

In addition, Quotron will enhance its proprietary financial information services software to run on IBM's RISC System/6000 workstations. It will also let IBM manage all its customer support functions, including fielding customer calls, dispatching technicians and resolving all network and systems problems.

Financial terms of the agreement were not disclosed.

The deal will enable Quotron to achieve significant cost savings and upgrade its proprietary hardware, which many consider obsolete, according to Max Gould, chief operating officer at the company, based here.

Citicorp, which owns Quotron, has invested more than $1 billion in the firm, but the unit has failed to make a profit, according to a recent article in *The Wall Street Journal.*

About 70 exchanges feed financial information to Quotron's data centers here and in Silver Spring, Md., across low-speed leased lines. The data centers are connected to eight regional data centers via T-1 and T-3 circuits. These regional centers are linked via T-1 and 19.2K bit/sec circuits to 51 nationwide intelligent concentrators, which in turn are connected using low-speed leased lines to Quotron's 5,000 customer sites.

IBM will migrate Quotron's T-1 and T-3 backbone to the IBM Information Network, a public value-added net, and assume responsibility for managing the low-speed tail circuits going to customer sites as well as the low-speed leased lines connecting the exchanges to Quotron's two main data centers, Gould said.

Quotron will continue to own and manage its data centers. Gould said the firm will not transfer any data center or network personnel to IBM.

The deal will enable Quotron customers to use an IBM RS/6000 workstation as a server running the firm's financial services applications. Until now,

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INDUSTRY BRIEFS

Dun & Bradstreet, Sybase team up. Dun & Bradstreet (D&B) Software and Sybase, Inc. recently announced an agreement under which D&B Software will bolster its forthcoming client/server offerings by integrating Sybase's SQL Server relational database management system into them. Under the agreement, D&B Software will also resell Sybase's SQL Server. D&B Software will incorporate SQL Server as an application database engine at the server level of its new client/server products, which will be rolled out during 1992.

New Chicago loop on tap. Jones Lightwave, Inc. and Thurston Group, Inc. recently announced that they have formed a joint venture to build a fiber-optic local access service network in Chicago. The start-up, dubbed Jones Chicago Lightwave, Inc., will build a network consisting of more than 200 miles of fiber backbone and customer loops. The network, which will compete with Illinois Bell Telephone Co., Metropolitan Fiber Systems, Inc. and Teleport Communications-Chicago, will transport voice, data and video traffic. The new carrier plans to use Synchronous Optical Network-based gear in its net.

Network construction will start in February with completion scheduled for the middle of next year.

Proteon to air wiring hub

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90 to leapfrog the functionality of IBM's 8230 controlled access unit, its top-of-the-line token-ring hub. Proteon currently offers a token-ring media access unit, dubbed the Series 70 Intelligent Wire Center.

The Series 90 will also make Proteon more competitive with Cabletron Systems, Inc., SynOptics Communications, Inc. and other smart hub vendors.

"Proteon was forced to go into this environment, and they've taken the best of all concentrator technologies on the market today and combined them into its box," said Bruce Bancroft, an owner and a vice-president of Trellis, a Princeton, N.J.-based value-added reseller and systems integrator that has installed the Series 90 at two user sites. Bancroft declined to name the users.

The Series 90 is a 19-in.-wide, rack-mountable chassis that has 10 slots for front-loadable media access modules, according to Nate Kalowski, Proteon's vice-president of marketing. The hub can support as many as 100 users, compared with the Series 70, which is aimed at users supporting 30 or fewer nodes per wiring closet.

The Series 90 features two token-ring and two Ethernet buses.

The product will support 10 token-ring nets and multiple Ethernets, although Kalowski declined to be more specific. Proteon will initially only offer token-ring modules, while Ethernet modules are expected to be rolled out in mid-1992, he said.

Proteon will offer an unshielded twisted-pair token-ring media module that supports as many as 10 users and two shielded twisted-pair modules, including a 10-user module that works with DB9 connectors and a five-user module using IBM connectors.

Ethernet media modules will include a 12-connection 10-Base-T module and a 10Base-T/10Base-F module for linking hubs in campus environments.

The vendor plans to eventually roll out FDDI modules, but Kalowski declined to provide more details about that.

The hub modules are hot-swappable, which means users can swap modules out without disrupting nodes supported by other modules.

Net management support

While details were sketchy on how Proteon would provide network management, observers said users will be able to manage the Series 90 hub and attached devices under Proteon's OverView Network Management System software running on an attached workstation. An IBM NetView interface will also be available, they said.

Proteon is working on a Simple Network Management Protocol-based management product called ONEView, which will support token ring and Ethernet networks, Bancroft said.

Additionally, the vendor will provide an out-band network management module, which lets users manage the hub by dialing into it via a modem.

Proteon, which already markets its own routers, is expected to make available in the second quarter of 1992 a router module that will let users route between networks supported on Series 90 hubs, Kalowski said.

The Series 90 can be configured with two power supplies — a primary unit and an idle one that automatically kicks in if the primary unit fails.

Late starter

Although Proteon is late in entering the high end of the hub market, the Series 90 has some advantages over existing products, Bancroft said. Proteon's aggressive pricing of the Series 90 is one differentiator.

Proteon will price its hubs between $123 and $189 per token-ring port, depending on configuration, Kalowski said. That compares to prices ranging from $250 to $350 for products from some of the leading hub makers. Ethernet prices were not available at press time.

Analysts applauded Proteon's entrance into the intelligent wiring hub market. With its token-ring expertise, the company will have an edge over established vendors such as Cabletron and SynOptics when selling into large token-ring accounts.

"Cabletron, SynOptics and other hub vendors have been coming onto Proteon's turf with their own token-ring products," said Rick Kimball, an analyst at Montgomery Securities, a brokerage firm in San Francisco. "Now Proteon is going to get into their turf, too. And remember, Proteon has the benefit of seeing what the other vendors have done."

Unisys upgrades CP2000 device

continued from page 4

ally, a Digital Equipment Corp. VAX running DEC's SNA gateway software is linked to an IBM 3725 front end, which is also attached to the IBM mainframe, according to Larry Austin, senior software specialist at World Bank.

The bank uses IBM NJE protocols to support file transfers and LU 6.2 for electronic mail. "It all appears as an SNA network and requires no software changes on the IBM side that are any different from [those needed to] connect to an IBM node," Austin said.

A low-end solution

For users of the smaller Micro A that may not be able to justify the $20,000 to $30,000 price tag of a CP2000, Unisys unveiled the MACP100 card.

Outfitted with new Unisys software, the card gives the Micro A and the newer Micro A Cooperative Computing Platform support for SNA PU 2 and PU 2.1 as well as a host of protocols. It enables the machine to attach directly to a network without a front-end processor.

Among the protocols supported by the MACP100 are X.25, asynchronous protocols, SDLC, Binary Synchronous Communications and Unisys' Poll/Select.

Each MACP100 supports as many as four 38.4K bit/sec communications links, or three lines can be pooled to form a single 56K bit/sec link. A single Micro A supports as many as three MACP100s.

Software similar to that used by the MACP100 can also be installed on the existing CPDLP A Series mainframe boards to give larger A Series machines native support for SNA PU 2.

All of the new and enhanced products will be available in February. The MACP100 card costs $6,000. PU 2 software for either the MACP100 or the CPDLP is priced at $3,128, while enhanced CP2000 PU 2 software costs $7,179 and enhanced CP2000 PU 5 software costs $29,304.

IBM gets nod to run Quotron

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Quotron customers have had to use Quotron 800 or 1000 minicomputers, which the firm developed on its own before high-powered workstations became available.

At the desktop, Quotron customers will be able to use IBM Personal System/2s or any Intel Corp. 80386 workstation that runs Microsoft Corp.'s Windows.

Gould said IBM's RS/6000 is the first of many industry-standard platforms that Quotron will integrate with its software in the coming years. He declined to disclose which other platforms the company is planning to support.

IBM will handle Quotron's customer support out of a new facility it is building in Uniondale, N.Y. IBM will manage each customer problem until it is resolved, including dispatching technicians to a customer site if necessary.

According to Gould, technicians from Phoenix Technologies, Inc. will continue to service the Quotron 800 and 1000 minicomputers, while IBM technicians will service their own equipment as well as devices from other vendors.

COS mulls skinny stack

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of business strategy at COS.

The skinny stack concept was introduced to users at the COS Transition Forum earlier this month, during which users and vendors discussed strategies for migrating to open systems. Users who attended the forum said they are intrigued by the concept but need time to examine it.

According to some users, the skinny stack might be a good way to implement OSI applications in which limited amounts of data need to be passed back and forth quickly, such as with database lookups. Because the skinny stack reduces the upper three layers of OSI to a bare minimum, it lessens overhead that could bog down application response times and consume extra network bandwidth.

To follow up the user interest in the skinny stack, COS has formed a work group within its architecture committee to refine the concept and package it as an OSI profile. The committee would then add the skinny stack profile to COS' profile selection guide and submit it to the International Standards Organization as an international standard profile.

Skinny Windows

The skinny stack concept grew out of a debate last year between members of the ANSI X3H3.6 committee, which oversees the X Window graphical user interface standard in the U.S., and X protocol developers from foreign countries about how to run the X protocol over OSI.

Many users in the U.S. wanted to run X over the full OSI stack, but U.K. developers wanted to run it directly on top of the transport layer to optimize performance.

Peter Furniss, a communications consultant at the University of London, proposed the skinny stack as a compromise, which was readily accepted by both sides.

According to Furniss, his implementation of the skinny stack requires about 400 lines of C code for the upper three layers of the OSI stack, which is minimal. By comparison, a full OSI implementation, with all options included, consists of thousands of lines of code and takes up about 40M bytes of memory, he said.

A bridge to OSI

Furniss and others believe users will see the skinny stack as an alternative to TCP/IP that will help them get into OSI with a minimum of work and reinvestment.

"The skinny stack provides the equivalent functionality of TCP, which is basically send-and-receive support," said Jim Quigley, technical advisor at Hewlett-Packard Co. in Cupertino, Calif., who presented an overview of skinny stack at the COS Transition Forum. "If your application is like X Window, which just requires simple send-and-receive support, then you don't need all the bells and whistles of OSI."

Applications written to TCP/IP using common transport APIs, such as Berkeley Unix's Sockets or X/Open Company, Ltd.'s X Transport Interface, should be able to run over the skinny stack, Quigley said. To make that happen, vendors will have to recode the APIs to support the skinny stack, providing users with hooks to both TCP and OSI transport-layer protcols, he said.

"The trick is that we can wedge the OSI skinny stack between these APIs and the transport layer," Quigley said. "What you end up with is an OSI-conformant, seven-layer stack."

This makes it feasible for companies to develop applications that run over OSI without learning the intricacies of programming to upper layers of OSI, which many developers find intimidating, according to Quigley.

"Theoretically, users won't have to do anything different when writing applications over TCP or skinny stack," he said.

But Quigley added that the skinny stack excludes a lot of the functionality built in to the upper layers of OSI, such as synchronization services and the ability to negotiate and transfer different forms of data. In the TCP world, this functionality is often built in to the applications, he said.

Users see possibilities

But the big advantage of the skinny stack is that it gives users a smooth migration path from TCP to OSI.

"Skinny stack will get users to adopt OSI," Quigley said. "Perhaps later on, they will realize there are services in the upper layers they want to take advantage of and they will grow into full OSI implementation."

But some OSI advocates believe the skinny stack gives up too much.

Laurie Bride, manager of communications technology at Boeing Computer Services Co. in Seattle, said the upper layers of OSI, which the skinny stack minimizes, are critical for achieving the systems and application independence that is fundamental to open systems. She also said the performance problems associated with OSI overhead will be mitigated with the introduction of faster and more powerful computer chips.

Other users also see possibilities in the skinny stack.

Mitre Corp., a government-funded research group, sees the skinny stack as a way to reduce bandwidth requirements, according to Forrest Colliver, lead engineer at Mitre in McClean, Va. "We are just beginning our investigation, but skinny stack gives us some possibilities," he said.

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

AT&T last week officially exited the telegraph business, ending more than 103 years in that market and relegating the final letter in the company's official name — American Telephone & Telegraph — to a mere reference of history.

Carrier Watch

Friday, Dec. 13, turned out to be an unlucky day for **AT&T** and its 800 service customers as a software glitch resulted in an outage that blocked 1.8 million 800 calls originating from points along the East Coast over a two-hour period.

A glitch in the database management system used in four signal transfer points (STP) accidentally allowed calling card routing tables that were being loaded into each unit's database to overwrite 800 routing tables.

According to an AT&T spokesman, the management system was developed by AT&T Bell Laboratories.

The STPs are grouped in pairs, with one serving as a redundant unit. As an additional safeguard, the carrier deploys two STP pairs in each region so if one fails, the other can handle duties for the entire region.

Nonetheless, four mated pairs were being loaded with the new calling card tables and malfunctioned at about the same time.

The mated pairs were located in New York City/White Plains, N.Y., Pittsburgh/Philadelphia, Atlanta/Birmingham, Ala., and Jacksonville, Fla./Jackson, Miss.

According to the AT&T spokesman, the new calling card routing tables were not due to be used until sometime next year.

The outage began at about 7:20 p.m. Service was restored two hours later.

Congressional report rips FCC handling of net outages

Concludes FCC did little to prevent recurrences.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In a recent report, Congress blasted the FCC's handling of network outages and warned that unless the agency acts soon, reliability of the public switched network could deteriorate further.

The report, which was the culmination of hearings and a separate investigation, was one more indication of Congress' growing dissatisfaction with the Federal Communications Commission's handling of network reliability issues.

"A good deal of the blame for telephone network vulnerability belongs to the [FCC], which has been unwilling to acknowledge the severity of the problem," said Rep. Bob Wise (D-W.Va.), who authored the report.

The report was endorsed by 10 other legislators from the House Subcommittee on Government Information, Justice and Agriculture, which Wise heads.

Despite a string of major outages of local and long-distance networks that left millions of customers without telephone service for several hours during the past year, the FCC has done little to prevent a recurrence, according to the report.

FCC Common Carrier Bureau Chief Richard Firestone disputed the findings. He said the agency has already taken steps on some of the report's recommendations and is unwilling to pursue others. Without singling out specific findings of the report, Firestone said "portions of the report either erroneously characterize the commission's activities to date or advocate policies that we do not endorse at this time."

Wise has already introduced a bill calling for the FCC to implement and enforce network quality standards, and some observers said Congress is likely to continue pressuring the FCC when lawmakers return in January.

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WASHINGTON UPDATE

BY ELLEN MESSMER

Banks are voluntary FTS 2000 users. The General Services Administration Board of Contract Appeals recently ruled on the case brought by US Sprint Communications Co. demanding that the Federal Reserve System be designated a federal agency and, therefore, be required to migrate to the Federal Telecommunications System (FTS) 2000. The Federal Reserve System comprises the Federal Reserve Board and 12 Federal Reserve banks throughout the country.

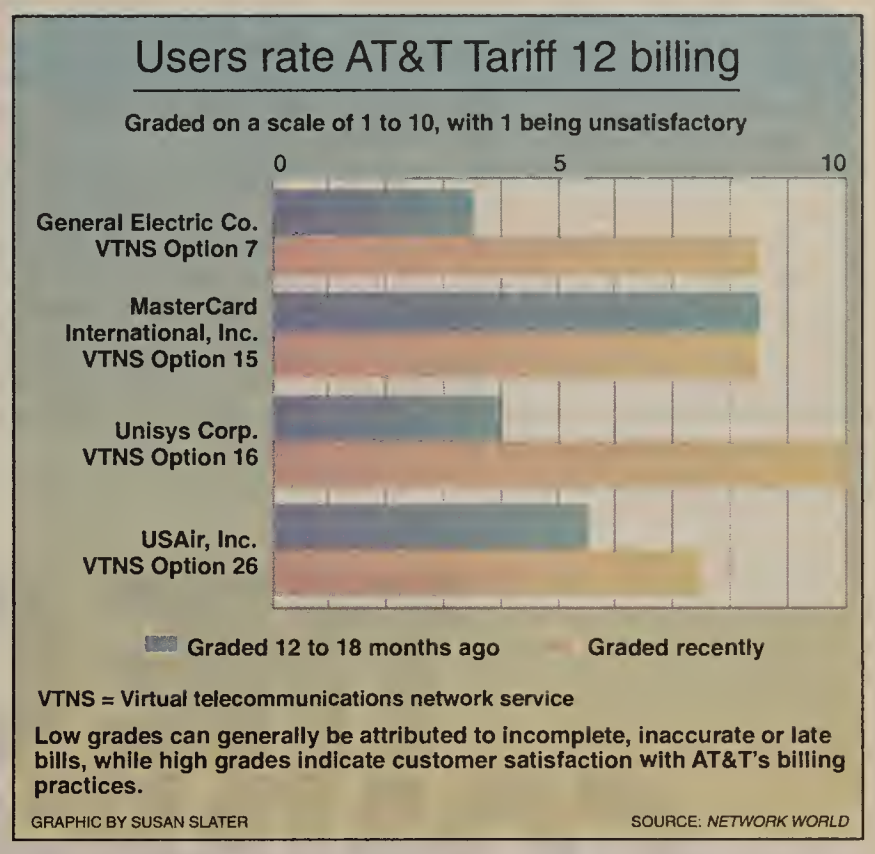
US Sprint, stating that the Federal Reserve System has refused to migrate to FTS 2000 despite being assigned to the carrier's network, filed a protest in October with the GSA appeals board on two federal bank telecommunications purchases. In its ruling, the appeals board determined that the Federal Reserve Board should be dismissed as a party to the case since US Sprint's protests center on telecommunications purchases of the Federal Reserve Bank of Atlanta.

"The procurements [that] are the subject of [US] Sprint's two protests are clearly the work of the Federal Reserve Bank of Atlanta, not the Board of Governors," the appeals board found.

In excluding the Federal Reserve Board from the case, the appeals board did not rule on whether the Federal Reserve is a federal agency. But in its decision, the appeals board determined that the 12 banks are not federal agencies, saying they do not qualify as such because they are not federally owned.

The appeals board also decided that the banks should be designated as "permissive users" of FTS 2000 services and allowed to use FTS 2000 voluntarily. "It is well known that within that network, there are some permissive users that are not federal agencies," the GSA board stated.

A spokesman for US Sprint said the company is reviewing the ruling and may soon appeal it, either through a request for review to the same appeals board or to the U.S. District Court of Appeals in Washington, D.C.



Tariff 12 bills much improved, users say

But AT&T is still struggling to rectify some issues like long delays in correcting billing inaccuracies.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T Tariff 12 users give the carrier passing grades for its efforts to resolve long-standing billing problems with the custom network service but said there is still room for improvement.

Late, inaccurate and incomplete Tariff 12 bills had placed a burden on users and made it nearly impossible to charge back departments for network services in a timely manner.

"On a scale of one to 10, I'd have given AT&T a four for billing 18 months ago," said James Bruno, Unisys Corp.'s worldwide telecommunications controller. "Today, though, I'd give them a seven. The bills and the billing process have improved, but they aren't perfect."

In 1989, Unisys negotiated a five-year Tariff 12 deal that carries a $16.1 million minimum annual charge. The computer manufacturer ran into major billing problems with its expanding network and instituted monthly bill review meetings with AT&T to address the problem.

"Eighteen months ago, our bills were anywhere from one to two weeks late and we had problems with just about every aspect, from having incorrect mileage for circuits to not having existing circuits listed," Bruno said.

Although Unisys was able to work with AT&T to address the late bill problem, it is taking AT&T a long time to correct inaccuracies.

"It had taken AT&T anywhere from 30 days to six months to get a correction on a bill," Bruno said. "The timeliness of the corrections has gotten better, but they're not being done in the 30-day window that AT&T had promised." Corrections are now taking roughly 60 days.

Ironically, AT&T's work to improve Tariff 12 bills by breaking out charges for services that were previously lumped together has created new problems. Unisys praised AT&T's efforts to provide more billing detail, but added that the carrier needs to better review the bills.

"We've had instances where the total for the bill which lists charges for the services we use does not match the total charge on the summary bill," Bruno said. "When changes are made to the bill they don't seem to be tested. As a result, the degree of confidence in what you receive is always in question."

Unisys is working with AT&T in its monthly billing review meeting to solve this new problem. "AT&T and Unisys have waded through an awful lot of difficulty for a long period of time," said Gil Piddington, worldwide telecommunications director for Unisys. "But they have put plans together for solving [Tariff 12] billing problems. They've implemented their plans roughly as outlined but that doesn't mean things are perfect just yet."

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Users say Tariff 12 bills much improved

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AT&T's Tariff 12 billing problems have forced many customers to hold bill review meetings, said Tom Walton, president of Walton & Walton Associates, a Richmond, Va., consultancy. "The sheer size and complexity of the bill — and problems with it — drove [Tariff 12] companies to establish these meetings to hash out problems," he said. "This is not a practice users go through with most other net services."

While most Tariff 12 customers hold monthly bill review meetings, billing was so bad early on that General Electric Co. had two or more meetings a month with its AT&T account team to discuss inaccurate and incomplete bills.

"A year ago, [Tariff 12] billing was an absolute nightmare," said Stanley Welland, GE's corporate telecommunications manager. "We were sweating bullets. Our seven-person billing staff in Princeton, [N.J.] took a lot of five-minute lunches last year."

AT&T's Tariff 12 billing problems meant extra stress for GE because it bills back its far-flung divisions for service usage. "When we rebill it, then we become a headache to our divisions if our bill isn't accurate," Welland said. "We get sandwiched between our users and the carriers because our late bills were throwing their budgets askew."

GE's Tariff 12 monthly bills were late and charges for some sites didn't show up for several months, Welland said. But GE, like many other Tariff 12 users, has witnessed a major change in the billing process.

"In the second half of 1990, I would've given AT&T a three or a four on billing," Welland said. "But now, I'd give them an eight or a nine because they've turned 175 degrees and the result is we are getting an up-to-date and almost perfect bill."

Other large Tariff 12 users, such as USAir, Inc., agree. USAir entered a five-year Tariff 12 agreement in 1990 that carries a $22.6 million minimum annual charge.

"Over the past several months, things have improved with billing," said Ben Styers, USAir's team leader. "I would have given them a five or a six in July, but would give them a seven or eight now."

Early on, USAir was receiving bills that were incomplete and sometimes listed the wrong location of net sites. In other instances, bills were sent to the wrong location. But, like Unisys and other customers, USAir started having monthly bill review meetings in which the airline and its AT&T account team discuss each bill and solutions to problems.

AT&T keeps USAir abreast of any planned changes to the bill including enhancements. "I seriously believe that things have improved tremendously," Styers said.

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Report rips FCC handling of outages

continued from page 9

The congressional report concluded that a number of technical developments — such as increases in the concentration of network traffic through a few points, the reliance on complex software and the interconnection of different carriers' networks — have all contributed to an erosion in network reliability.

"The public switched networks are becoming increasingly vulnerable to failure, and the consequences for consumers, businesses and human safety are devastating," the report stated.

"It is not completely clear that there are sufficient incentives under price cap regulation for carriers to maintain their nets at optimal levels," the report stated.

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Although some of the technical problems causing outages, such as software glitches, may have been beyond the control of the FCC, Congress said that some of the agency's policies have contributed to the problem.

For example, the lawmakers said price cap regulation, which sets prices on rates rather than on profits, may have given carriers the incentive to cut costs and keep more profits by scaling back maintenance and network upgrades.

"It is not completely clear that there are sufficient incentives under price cap regulation for carriers to maintain their nets at optimal levels," the report stated.

FCC officials in the past have maintained that price cap regulation encourages investment in the network because carriers need modern equipment to be more productive and, therefore, cut costs.

The lawmakers laid out several steps that they believe the FCC must take in order to improve network reliability, including imposing a requirement for carriers to immediately report outages; establishing a scale for measuring the impact of service outages; and setting national network standards, including a network reliability factor in the formula for setting rates under price cap regulation.

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Sales of frame relay service in the U.S. will reach $370 million by the year 2000, according to market research firm Trans-Formation, Inc. in Tulsa, Okla.

Data Packets

Systems Strategies, Inc. of New York and **The Boston Software Works, Inc.** of Boston recently announced a joint development and marketing agreement for products that will enable users of IBM's OfficeVision/400 and Digital Equipment Corp.'s All-In-1 to exchange electronic mail, word processing documents and other types of data over IBM LU 6.2 sessions.

Boston Software Works' InterOFFICE E-mail and office automation software will be integrated with Systems Strategies' ezBRIDGE Peer-to-Peer, which is DEC VAX/VMS-to-IBM Application System/400 communications software based on LU 6.2..The integrated package will perform message transfer and directory synchronization. This will allow OfficeVision/400 and All-In-1 users to employ native commands to send and receive data such as E-mail, text memos and spreadsheets.

Integrated ezBRIDGE/InterOFFICE products will be distributed by both vendors beginning in March. Pricing for ezBRIDGE Peer-to-Peer ranges from $10,000 to $35,000. InterOFFICE costs between $4,500 and $24,500.

Dynatech Communications, Inc. of Woodbridge, Va., and **Newbridge Networks, Inc.** of Herndon, Va., recently announced the successful compatibility testing of their respective frame relay products. Newbridge's Frame Relay Switch and 8230 MainStreet Ethernet Bridge have been found compatible with Dynatech's CPX-10 and CPX-20 packet switches.

Bell Labs builds 2.5G net as test bed for applications

Carriers will use net to mold broadband services.

By Ellen Messmer
Washington Correspondent

MURRAY HILL, N.J. — AT&T Bell Laboratories recently said it has deployed an experimental 2.5G bit/sec network linking three Bell Lab locations in New Jersey.

The network — dubbed LuckyNet after Robert Lucky, executive director of Bell Labs, who testified before Congress in support of the National Research and Education Network (NREN) — is being used as a test bed for such high-bandwidth applications as videoconferencing, document retrieval and local-area network interconnection.

"LuckyNet is a heterogeneous network that will provide a fertile test bed for investigating broadband applications, network architectures, gigabit packet switches, LANs, high-throughput protocols and interfaces, network services, and operations," said Richard Gitlin, head of Bell Labs' network systems research department.

LuckyNet supports a microwave radio link between Bell Labs' New Jersey locations in Murray Hill and Crawford Hill. The net also supports a fiber-optic connection between the Crawford Hill site and a Bell Labs facility in Holmdel, N.J.

Although traffic between the three locations is carried at 2.5G bit/sec, the network access is only 155M bit/sec due to technical limitations. However, Bell Labs researchers are working to increase network access to gigabit speed.

Although there is no multiplexing equipment available today to handle the high speeds on LuckyNet, Bell Labs has designed the network to adhere to the same multiplexing scheme as the Synchronous Optical Network multiplexing hierarchy.

Initially, clear-channel transmission at 155Mbit/sec is being tested, with Ethernet-to-Ethernet interconnection and videoconferencing scheduled as the first applications.

The Bell Labs research team is also investigating Broadband In-

(continued on page 12)

DEC adds TCP/IP, POSIX support to real-time wares

By Jim Duffy
Senior Editor

ANAHEIM, Calif. — Digital Equipment Corp. recently extended its real-time computing capabilities to Unix environments and disclosed plans to implement TCP/IP and Portable Operating System Interface (POSIX) extensions to its VAXELN application development environment.

DEC also brought out a new version of its RALLY object-based application generator for developing interactive database applications.

Real-time computing is applicable to computer-integrated manufacturing networks where manufacturing tasks are dependent on data being processed on the fly to react to changing production conditions.

The products are designed to broaden DEC's portfolio of real-time computing offerings.

The products include a new version of DEC's VAXELN software — which is a developer's tool kit for real-time VMS applications and run-time software to execute those applications — and DECelx software for development of real-time Unix applications.

Version 4.3 of VAXELN complies with POSIX 1003.1 and 1003.4 standards for real-time application portability. It also supports Transmission Control Protocol/Internet Protocol's Telnet terminal-emulation protocol for remote terminal access to the host computer via the nationwide Internet network.

DECelx software Version 1.0 runs on any Reduced Instruction Set Computer-based DECstation or DECsystem processor and includes networking tools, device drivers and a programming language environment for development of distributed real-time applications. It is said to parallel the function of VAXELN but in a Unix environment.

DECelx tools include Sun Microsystems, Inc.'s Network File System; TCP/IP with Telnet terminal emulation and File Transfer Protocol file transfer protocols; remote procedure calls; and device drivers for I/O, terminals and disks.

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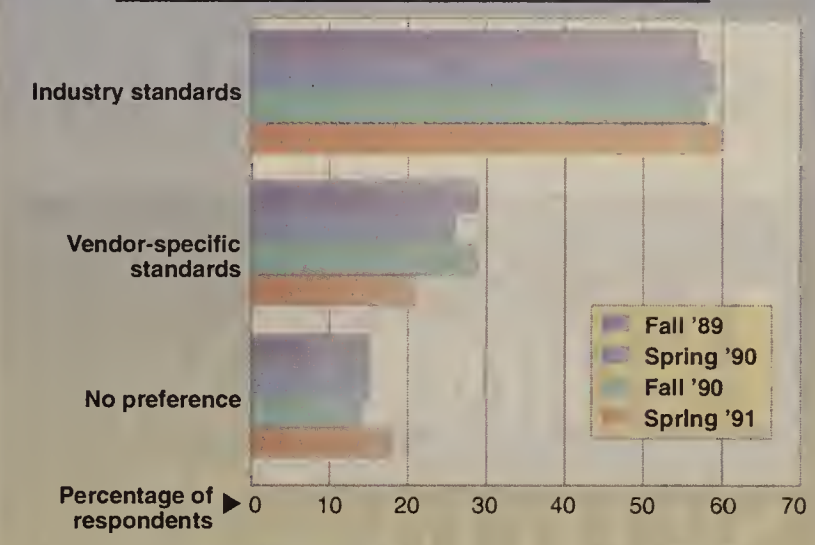
Users favor industry standards



In a survey of 789 Digital Equipment Corp. product users, the majority have consistently favored industry standards over vendor-specific alternatives including DEC proprietary standards.

SOURCE: DIGITAL EQUIPMENT COMPUTER USERS SOCIETY, SHREWSBURY, MASS.
GRAPHIC BY SUSAN SLATER

DEC users reluctant to implement NAS

Although supportive of the software strategy, backers hinge plans on arrival of PC applications.

By Jim Duffy
Senior Editor

ANAHEIM, Calif. — Users of Digital Equipment Corp. networks are delaying implementation of DEC's Network Application Support (NAS) software architecture until NAS-compliant microcomputer applications reach critical mass in the market.

Although attendees at the recent Digital Equipment Computer Users Society symposium here said the company's NAS strategy is generally consistent with their needs, they said DEC is only now starting to fill holes in its NAS client workstation platform.

"I think [NAS] is a good idea," said Edward Haskins, application analyst at Eastman Kodak Co. in Rochester, N.Y. "We just have to see the application people catch up with it."

NAS is a set of application program interfaces, based on industry standards and DEC proprietary technology, that enables software developers to build portable distributed applications for accessing and sharing information in a multivendor environment.

Under NAS, users can position VMS, Ultrix and OS/2 devices as either clients or servers, and MS-DOS, Apple Computer, Inc. Macintosh, DEC VT, the X Window System and IBM 3270 terminal, and, most recently, Microsoft Corp. Windows 3.0 and Sun Microsystems, Inc. SunOS as client workstations.

NAS is the cornerstone of DEC's Open Advantage initiative, an ambitious strategy to position the company and its products as integrators of multivendor hardware, software and networks. DEC, which continually emphasizes its Open Advantage directive as well as its prowess as an integrator, is relying on these strategies to attract new customers and retain existing ones.

Vik Muiznieks, DEC's manager of the NAS program office, claims there are more than 2,400 NAS applications available and that 1,000 vendors are writing to the specification. He also says DEC is selling 40,000 to 50,000 NAS client licenses per month.

Even so, users are looking for NAS-compliant personal computer applications to integrate with applications running on installed VAXes on DECnet networks. The problem thus far, users say, is that some of the "standards" NAS mandates — X Window and DECwindows interfaces as well as Compound Document Architecture services — are not applicable or have not been adopted by the PC community.

"They didn't have a user interface that I wanted," said Gary Mauler, fellow engineer at Westinghouse Electric Corp. in Baltimore. "I wasn't about to put in anything character-based; I wasn't about to put in the X Window [System]."

Moreover, DEC's legacy of lacking a credible PC strategy has become an albatross for NAS. "The problem with NAS is I don't think PC vendors take DEC seriously enough," Mauler said.

DEC acknowledges the mis-

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DEC adds to real-time wares

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Version 3 of RALLY includes a run-time client package for MS-DOS personal computers.

RALLY allows users to access DEC Rdb and third-party databases through an Open Data Interface. The MS-DOS client software in Version 3 uses DEC's SQL/Services and Pathworks networking software to access those databases and off-load front-end screen processing from a host to local workstations.

The VAXELN Version 4.3 tool kit is priced at $3,140 and will be available next month.

Development licenses of DECelx Version 1.0 are priced from $10,200, and run-time licenses are tagged at $600. The software will be available in the first half of next year.

A run-time version of RALLY Version 3 for MS-DOS is $235 per client. For VMS workstations, the price is $800, rising to $33,750 for the VAX 9000-400 series processors. Version 3 will ship in February.

Users reluctant to employ NAS

continued from page 11

communication on user interfaces.

"Part of it has been our own problem articulating our client base," said Dennis Phelan, DEC's NAS marketing manager. "DECwindows and [the Open Software Foundation, Inc.'s] Motif are standards for workstations. DEC's strategic direction is to provide full support for Windows 3.0. Customers and developers are encouraged to standardize on the graphical user interface of their choice."

Indeed, DEC is only now starting to articulate its interface strategy for client workstations — and address a latent, potentially lucrative market — through alliances such as the one with Microsoft to tie Windows clients into DEC's All-In-1 office system through Pathworks local-area networks ("DEC, Microsoft embark on Windows initiative," *NW*, Nov. 25).

Microsoft will also develop future versions of its Word for Windows and Excel for Windows applications to NAS interfaces. Lotus Development Corp. said it will do likewise with its popular Windows-based applications.

According to users, it's about time.

"If they waited another year or two with TeamLinks [the NAS-compliant Windows to All-In-1 product set unveiled last month], we would have been forced into LAN-based electronic mail" from another vendor, said Richard Copeland, project leader of information technology at manufacturer Corning, Inc. of Corning, N.Y.

DEC's Muiznieks concurred with user assessments that PC applications are critical to NAS' success. "We have to get alliances [similar to the Microsoft arrangement] to get this stuff rolling."

According to analysts, these types of arrangements will indeed spur application development and stimulate user interest. But a base of satisfied NAS users is vital to the architecture's viability, they say.

"[NAS'] long-term success hinges on how well DEC can get people to adopt it," said John Morrell of International Data Corp. in Framingham, Mass. "They've got to get their installed base to utilize it and get reference accounts."

Bell Labs builds net as test bed

continued from page 11

tegrated Services Digital Network at 155M bit/sec speeds as a LuckyNet transportation method. AT&T also hopes to discover if Asynchronous Transfer Mode can be scaled up to a gigabit-per-second network.

AT&T, a strong supporter of the government's NREN project that will be officially launched in the upcoming year, is also participating in Blanca, one of the half-dozen government-funded gigabit test bed projects in progress through the country.

Gitlin said AT&T hopes LuckyNet will eventually be linked to Blanca.

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Worth Noting

"We will focus on selectively supporting specific components of [the Open Software Foundation, Inc.'s Distributed Computing Environment]. Not all of it is applicable to our world and our technology."

Darrell Miller
Executive vice-president
Novell, Inc.
Provo, Utah

Netnotes

Concord Communications, Inc. last week added a tool called Automapper to its existing Trakker internetwork monitor.

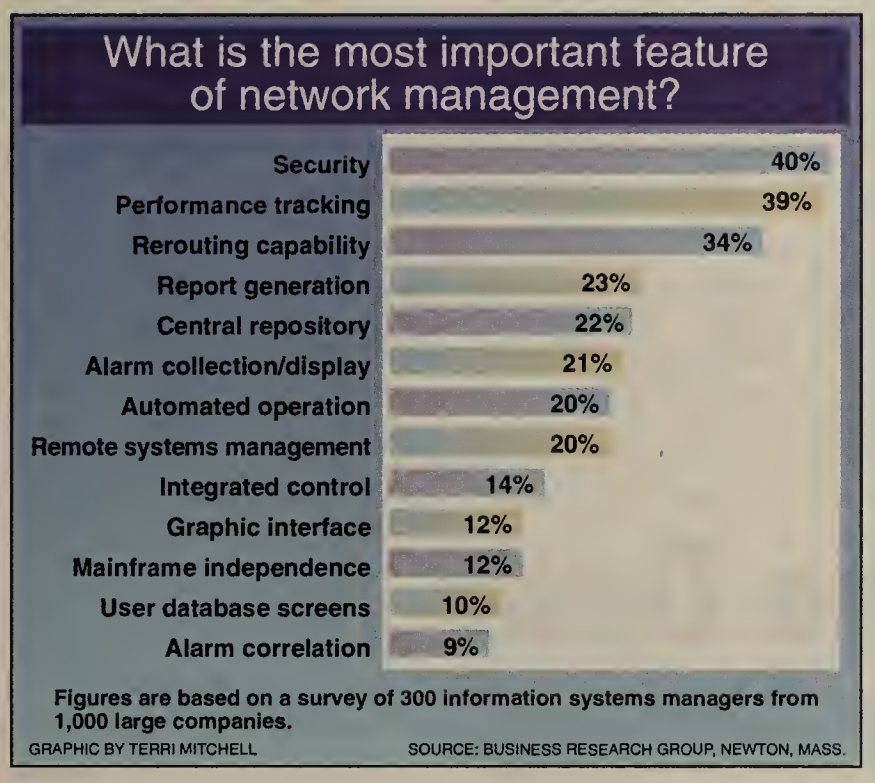
The new product automatically locates all devices on internetworked Ethernet local-area networks and displays them on a color map.

Trakker, announced in June ("Internet monitor is firm's first LAN mart entry," *NW,* June 10), is both an Ethernet monitor for multisegment LANs and a protocol analyzer. It collects data on nodes and LAN segments at every protocol level in real time.

The product consists of monitors for remote segments and a central management application that runs on a Sun Microsystems, Inc. SPARCstation. Based on the Simple Network Management Protocol, the product records information such as retransmissions, time-outs, disconnects, flow control messages and failed connection attempts.

Because Trakker is protocol-independent, the new Automapper tool can discover all LAN nodes regardless of protocol. It lets administrators identify nodes by name and location on an internetwork, even if the network supports segments with different addressing schemes.

Automapper is available now as a standard feature of Trakker, which costs $30,000 for two LAN segments.



GUPTA offers DBMS server product for NetWare, Unix

Version offers new functions, better performance.

By Timothy O'Brien
West Coast Bureau Chief

MENLO PARK, Calif. — GUPTA Technologies, Inc. recently announced SQLBase 5.0, a new version of its SQL database server software that runs under Unix and Novell, Inc.'s NetWare, offering increased performance and data integrity.

By making SQLBase available for major platforms such as DOS, OS/2, NetWare and Sun Microsystems, Inc.'s version of Unix, GUPTA is hoping to land more database business to complement its growing success in database connectivity query and software and development tools.

"With this release, GUPTA has done all the right things to position SQLBase to be a success," said Frank Michnoff, program director of desktop computing strategies at the META Group in Stamford, Conn. "However, the tools and the connectivity software are still GUPTA's strongest offerings."

Finding its niche

For years, GUPTA has attempted to carve out a niche by promoting both its SQLBase and SQLWindows client/server development environment as easy-to-use products designed specifically for the personal computer local-area network environment.

Yet GUPTA's success to date has been based less on its database server software and more on providing tools and connectivity software that customers can use to access competitors' database products, such as Microsoft Corp.'s SQL Server and Oracle Corp.'s database server.

GUPTA hopes to reverse its fortunes in the market for back-end database products with this new product by offering support for additional platforms and increased performance and capabilities.

GUPTA has optimized SQLBase to offer increased performance in the areas of queries, graphical applications and transaction processing for the various LAN server platforms it supports.

Specifically, the increased functionality for graphics applications includes improved Microsoft Windows support, various locking and isolation features to allow users better concurrent updating of data and cursor context preservation that maintains cursor positioning through an update process.

Outperforms NetWare

GUPTA claims that its own benchmark tests measuring transaction processing speed show that the product for NetWare environments, a Network Loadable Module of SQLBase for NetWare 3.11, outperforms the Oracle server product for NetWare by a 2-to-1 margin.

Others concurred. "There is no doubt about it, SQLBase really screams on NetWare," said Darrell Miller, Novell's executive vice-president.

Performance was improved by adding support for large partitioned databases — containing as much as hundreds of gigabytes of data — which can span multiple disk drives.

Another important new feature in 5.0 is referential integrity,

(continued on page 14)

Firm goes paperless with imaging system

Network helps Kenwood streamline handling and storage of hundreds of warranties and invoices.

By Caryn Gillooly
Senior Editor

LONG BEACH, Calif. — Paperless offices may still be a pipe dream for most companies, but Kenwood USA Corp. is well on the way to replacing paper with a local-area network-based imaging system.

In response to a top management edict to move Kenwood to a paperless environment, the company is implementing an imaging system that is expected to save more than $100,000 a year.

Jim Lawson, information systems manager at Kenwood, a $400 million consumer electronics company based here, said the entire system, when complete, will cost about $350,000 and will pay for itself in 3½ years.

Before the edict, Kenwood had two small Novell, Inc. NetWare 2.12 LANs, each with their own file server, and a McDonnell Douglas Corp. Series 18 mainframe supporting personal computers emulating terminals.

The LANs, which were in the product planning and audio departments, were used to share files and printers. The rest of the company, including the credit department and the engineering/service department, used PCs to access the mainframe. The host-based applications — warranty claims and invoice processing — were the first to move to the imaging system.

According to Lawson, warranty claims was one of the more paper-intensive activities within the firms. Each day, Kenwood receives about 100 warranty claims from its dealers. Since each form contains eight to 12 pages, Kenwood receives more than 1,200 pages of forms on any given day.

With the old system, company employees manually entered the form data into Kenwood's mainframe. The original forms were then stored in filing cabinets for three months, after which they were boxed and sent to a warehouse. Disputes concering processed documents required personnel to find the original forms, either in an on-site filing cabinet or in the warehouse.

Besides being time-consuming, the system limited document sharing. "If someone retrieved one of the copies, it was in their possession," Lawson said, noting that no one else could use it. In addition, with that much paper

(continued on page 14)

Frye preps LAN inventory tool for January release

By Caryn Gillooly
Senior Editor

BOSTON — Frye Computer Systems, Inc. plans to release by January a product that can automatically inventory virtually all hardware and software on a local-area network.

The new tool, called the LAN Directory, will enable administrators to keep track of personal computer and Apple Computer, Inc. Macintosh hardware and software on the network.

According to Russell Frye, founder and president of the company, based here, the software product has two primary parts. The first is an agent that gathers information from each network device. The agent can either reside on the server, where it collects information as clients log on, or on the clients themselves.

Agents can gather information about the type of computer being used, the auxiliary cards installed, the software and version number running and the files on the computer, among other things.

"You can get about 700 different details from both PCs and Macs," Frye said. In addition, the software can be customized to let the administrator specify other types of information to be collected that may not be included in those original 700 items.

The second part of the package is software that allows net managers to review and analyze all the collected information. The software can reside on any machine on the network, although the company recommends a central location such as the network server.

This component includes a report writer that enables the ad-

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Firm goes paperless with imaging system

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processing, it was not unusual for a warranty to get misplaced or misfiled.

Handling of invoices was also problematic. Before implementing the imaging system, invoices based on each day's shipments were printed out and mailed the following day. The documents were then spooled to magnetic tape and sent to a service bureau for copying to microfiche — a process that took three to five days.

Twenty Kenwood employees had to share a single microfiche reader to look up invoices. If someone called with a question on an invoice, "You'd have to take a name and number and call the customer back," Lawson said.

To solve both problems, Kenwood installed in the warranty claims and invoice processing departments a 10Base-T Ethernet-based NetWare 3.11 LAN running an imaging package called FilePower from Optika Imaging Systems, Inc. in Simi Valley, Calif.

The LAN supports an Intel Corp. 80486-based file server connected to an optical jukebox, a server supporting a document scanner, several print servers, a separate server for downloading information from the mainframe and about 30 PCs running image retrieval software.

With the new network, claim forms are stored on optical disk by the scanning station, which uses Optika's ImageFiler software module to compress and manage the images. Optika's ImageFinder module can then retrieve and decompress the files from a designated workstation.

"There are three [advantages] to [having] claim forms on line," Lawson said.

"First is the time savings in answering inquiries; second is the promptness with which we can respond to dealers and service centers; [and] third is the savings we will realize in warehouse storage space," he said.

The new system also lets Kenwood eliminate reliance on microfiche. The imaging software provides automatic document indexing by selected document fields — such as order number, customer number, purchase order number and date — simplifying document retrieval and making it possible to answer inquiries while the customer is still on the telephone.

According to Lawson, the network installation began in February and was essentially completed in April, with expansion continuing as more departments begin to take advantage of the system.

The company has also upgraded its existing LANs to NetWare 3.11 and has linked them to the new LAN through bridges. This enables all departments to share customer and product information. Lawson said the company eventually hopes to extend the imaging capabilities to these original NetWare users as well as to the rest of the company.

The network currently supports 30 workstations, and the company plans to expand that to 100 within five years. "Our aim is to have a companywide imaging system," Lawson said.

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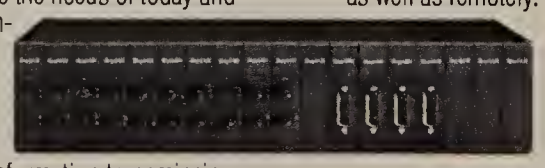

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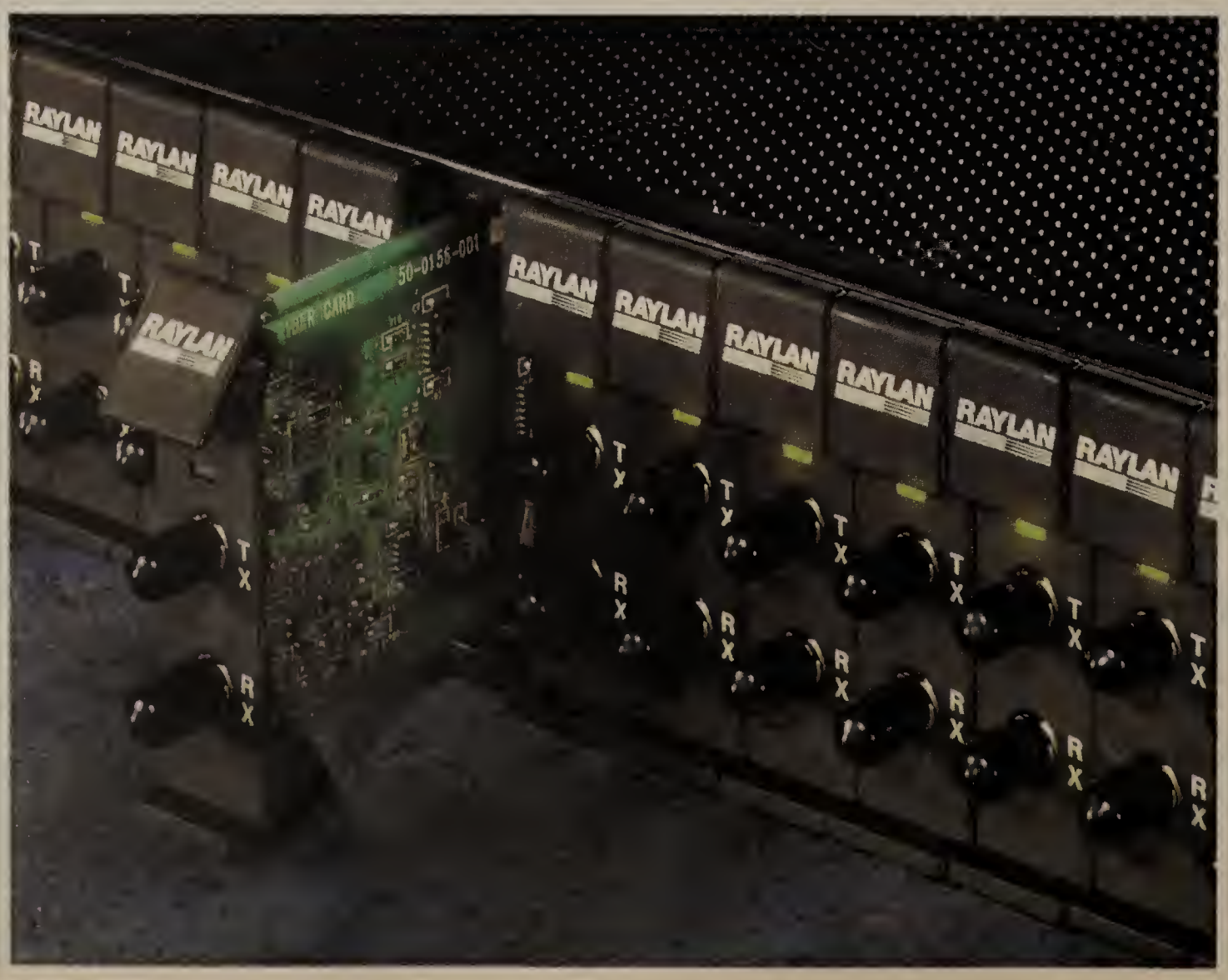

GUPTA offers DBMS server product

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which ensures that the server automatically enforces predetermined rules, such as restrictions on deleting employee information when accessing or updating multiple tables.

GUPTA employed referential integrity in order to be compatible with IBM's DB2 and other industry-standard databases. In another DB2-related addition, SQLBase 5.0 includes enhancements to its COBOL Precompiler, which is important to programmers who use their PCs as DB2 workbenches.

While GUPTA is highlighting the availability and performance of SQLBase on NetWare, the firm said the move to Unix was also necessary to give users a scalable migration path to a more powerful server platform than current PC servers.

All versions of SQLBase will be available next month except the Unix server, which is expected to be available in February. A five-user entry-level version of SQLBase costs $995, while an unlimited version costs $2,995 for DOS, $3,995 for OS/2, $4,995 for NetWare and $9,995 for Unix.

Frye preps LAN inventory tool

continued from page 13

ministrator to compile reports dealing with different aspects of the network. For example, the package comes with 12 preset reports that give net managers a consolidated listing of network devices, such as hardware, software and files.

As with the first part of the software, the report writer is customizable so that administrators can create individual reports as needed. If, for example, a net manager wanted to load new software on every network node, he might create a report listing the available memory for each workstation to see which users would need memory upgrades to support the new package.

According to Frye, the software will be available by the first week in January and will cost $495 for a 50-computer license. Licenses for additional 100-computer packages cost $395.

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

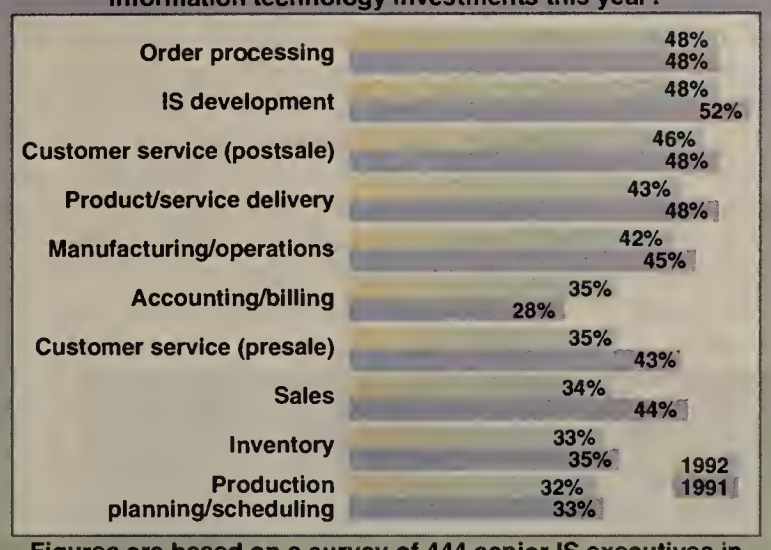
Worth Noting

"If users are looking for [interoperability] in the LAN internetworking world, they're not going to find it next year."

John Morgridge
President and CEO
Cisco Systems, Inc.
Menlo Park, Calif.

IS spending slips

Which business areas will receive significant information technology investments this year?



Figures are based on a survey of 444 senior IS executives in North American firms.

IS = Information systems

SOURCE: CSC INDEX, CAMBRIDGE, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Open systems groups focus on user needs

Reorganize, launch new services and offerings to help meet the needs of the user community.

By Wayne Eckerson
Senior Editor

Recognizing that users play a critical role in the growth of open systems, some groups have recently begun providing resources that can help sort out the business issues involved in migrating to an open network and computing environment.

Open systems groups are compiling reference material on open systems issues, developing educational courses geared toward business executives and reorganizing to give users a stronger voice. Some groups are also beginning to coordinate their educational and promotional efforts toward users.

"For the open systems movement to succeed, users have to play a greater role," said Richard Wood, director of user group relations at X/Open Company, Ltd. in Falls Church, Va.

X/Open, a consortium of more than 100 vendor and user companies that is defining an open computing environment based on official and de facto standards, recently created the user group relations position and recruited Wood from a leading user organization to fill that slot.

"X/Open is trying to shift from being an organization primarily driven by vendors to one in which users have an equal voice," Wood said. "The creation of my position reflects that."

X/Open's reinvigorated User Council, which has representatives from 40 large user companies, is busy working to translate user requirements for open systems into technical recommendations for presentation to vendors. The council is also developing a template that users can follow when writing case studies describing how they migrated to open systems, Wood said. The case study template is being put together by Harris Corp., which plans to submit it to X/Open for review.

Another active open systems group is the Corporation for Open Systems International (COS), whose mission is to facilitate the introduction of products based on Open Systems Interconnection and Integrated Services Digital Network standards. COS sponsors conferences and performs conformance testing and product certification.

Earlier this month, COS sponsored the Transition Forum in which vendors and users gath-

(continued on page 16)

Association Watch

The Conference Group, Lotus Development Corp. and **SRI International** are sponsoring a groupware conference Aug. 3-5 at the San Jose Convention Center in San Jose, Calif.

The conference, called GroupWare '92, will feature a keynote address by Jim Manzi, Lotus' president and chief executive officer, more than 75 vendor exhibits and 60 seminars and workshops on a variety of groupware topics.

For more information, contact David Coleman, conference chairman, at (415) 282-9151 or The Conference Group at (800) 247-0262.

The **International Communications Association (ICA)** and the **International Telecommunications Users Group (INTUG)** will sponsor the fourth World Communications Seminar Feb. 10-12 at Le Grand Hotel in Paris.

The seminar, scheduled to coincide with the INTUG Plenary meeting, will explore critical issues in standards development and the direction in which those standards must go to ensure global compatibility. The conference will also update users on regulatory issues in the Pacific Rim and Europe, including the deregulation of telecommunications markets and transborder data flows.

The conference costs $595 for ICA and INTUG members and $795 for nonmembers.

For more information, call (800) 422-4636.

Hospital network reduces paperwork for ICU nurses

Lets professionals do what they were trained to do.

By Maureen Molloy
Staff Writer

LA CROSSE, Wis. — Patients in the intensive care unit at Lutheran Hospital-La Crosse are receiving better nursing care thanks to a recently installed network-based clinical information system that has produced key ICU staff productivity gains.

The new system has enabled nurses to spend less time on paperwork and twice as much time caring for patients. It also has improved the accuracy of data collected, reduced overtime wages and trimmed one full-time position from the nursing staff.

"Like many hospitals, we are trying to return nurses to the professional challenges they were trained for," said Mary Lu Gerke, Lutheran's director of patient care services. "This means more direct patient contact, more consultation with the patient's family and less focus on filling out forms and other clerical tasks. The [new system] is significantly boosting this effort."

Lutheran is one of the first hospitals in the country to install Hewlett-Packard Co.'s CareVue 9000 clinical information system, which is designed to assist ICU staff in a variety of indirect care activities, including documenting the medical procedures performed on patients and tracking patient progress.

Terminals at each ICU bedside are linked to the HP 9000 workstation, which is located in the central nursing station and is connected to the hospital's local-area network. From a patient's bedside, nurses can access data that resides on other information systems in the hospital, such as the clinical laboratory net, where about 40% of all information detailed on patient charts is generated.

The HP 9000 creates an electronic replica of the hospital's patient-flow sheets, which include detailed notes of patient treatments, as well as medication records, nursing care plans, progress notes and acuity reports.

Since implementing the system, the hospital determined that ICU nurses spend 22% less time recording data in flow sheets, the single most time-consuming part of nursing paperwork.

The bedside terminals automatically record information generated by bedside monitoring devices, such as electrocardiogram machines, which are linked directly to the bedside terminals.

In addition, time-consuming manual calculations have been taken over by the computer. Complicated drug doses, for instance, which typically take an experienced nurse up to ten minutes to calculate, are now completed instantly.

"Not only is the record more complete, but [it is also] more accurate," said Gerke. "If a patient goes into cardiac arrest, the nurse doesn't have time to write down the patient's blood pressure every few minutes. The nurse might try to chart it later, but important data may be lost or noted inaccurately."

In addition to its administrative achievements, the system can also be used to track trends in patient care and make that data available electronically to other health care professionals.

GUIDELINES

BY ERIC SCHMALL

North Pole vendor brings gifts for net managers

The holiday season prompts us to think about ideal gifts. In laboratories not far from the North Pole, there are many items ready for Christmas delivery that are designed especially for network managers.

First is a Calm Bar that easily snaps onto the side of net managers' phone sets. This plastic switch produces a low-frequency, subliminal sideband message that induces a state of euphoria in the caller, especially if it is an irate user complaining about phone service. There are a variety of subliminal messages the device generates, including: "My complaint is pretty silly," "These network people are the heroes of the information age," and "This network manager is probably going to be our next CEO." Pushing the switch to the right increases the speed at which subliminal messages are generated. Soon the complainer is calm and apologetic and no longer has a problem.

The second Christmas gift will appeal to net managers tired

(continued on page 16)

Schmall is a network systems manager for an insurance holding company.

Open systems groups focus on user needs

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ered in a closed-door roundtable session to discuss ways to solve the problems that users face when migrating to open systems. Users attending the forum said the session was helpful and they look forward to attending future sessions, which will be scheduled every three or four months.

Also, COS will soon begin distributing a new self-study course on OSI that was developed by a consortium of Australian open systems groups, including the Australian MAP/TOP Users Group. The course, which has five self-contained modules, helps users examine the business case for moving to open systems as well as better understand the processes and issues involved in migrating to an open network computing environment, for example.

The User Alliance for Open Systems is a user-only group that is trying to identify and develop strategies in order to overcome the barriers to open systems. The group is building a database of reference material — such as newspaper articles, speeches and business cases — that it is collecting from its members. The User Alliance hopes to provide remote access to the database for members and other users.

The group is also trying to get members to write papers on specific issues involved in migrating to open systems, such as how to deal with legacy systems. These papers will also be stored on the database.

The Open Software Foundation, Inc. (OSF), a large vendor-dominated open systems group that is piecing together technologies to create vendor-neutral computing and communications environments, will soon offer a one-day course titled "The Business Case for Open Systems," which is designed to help managers develop a business plan for incorporating open systems. Most of OSF's current educational offerings are focused more on technology rather than business issues.

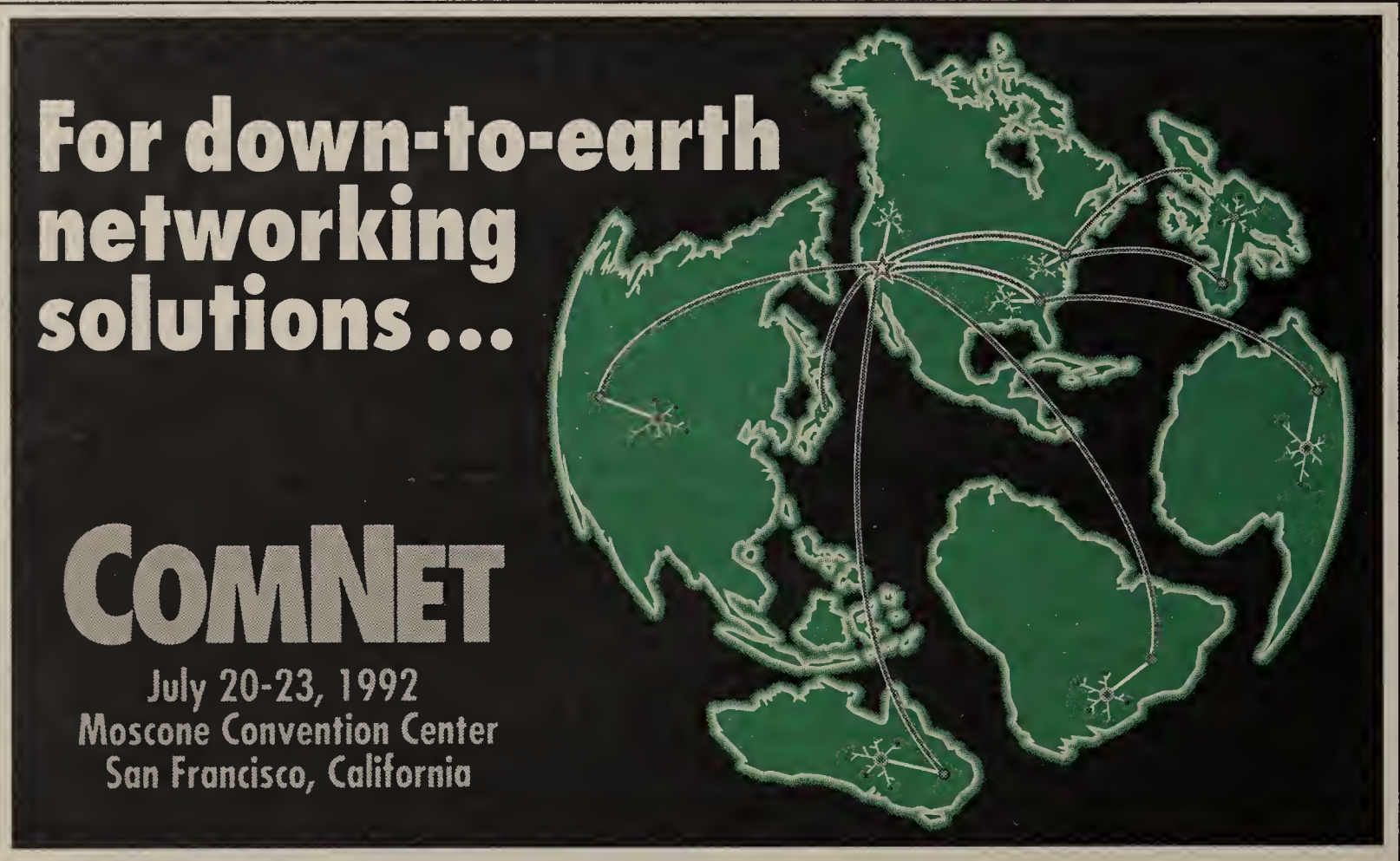
OSF is also developing two case studies of users who successfully migrated to OSF's Motif user interface. Those case studies will be available next year.

Besides individual efforts, there is growing cooperation among open systems groups to consolidate their efforts in the areas of user education and awareness.

COS, for example, recently sponsored a week-long conference that pooled the resources and programs of four open systems user groups under the COS umbrella: the User Alliance, the North American MAP/TOP Users Group, the North American ISDN Users' Forum and the Electrical Power Research Institute.

In addition, user representatives from several groups, such as X/Open, OSF and the User Alliance, are in the first stages of talks designed to more closely coordinate the efforts of those groups where there is overlap, according to one user representative who requested anonymity.

Wood said X/Open wants to work more closely with open systems groups in various industries such as petroleum and aerospace. "The more unified voice users present to vendors, the sooner vendors will begin developing products that users want," Wood said.



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NWA

North Pole brings gifts to net managers

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of listening to extremely long voice mail messages.

The North Pole labs have developed an adjunct processor to voice mail systems that can analyze long and unwieldy messages and succinctly state them in one sentence.

Using the latest high-speed processing technology, this "Get to the Point" voice processing device recognizes who is calling, analyzes the message, compares it to previous messages sent by the caller and summarizes the meaning of the message.

The next time you get a call from the person in auditing who insists on leaving a two-minute message just to ask whether you can attend a meeting next Thursday, you will wish you had this device. By simply hitting **6*, it will override the message and explain: "It's Torvald, the audit dweeb, whining about needing you at the meeting next Thursday. Just press 1 if you will attend and 2 if you won't."

After you respond, the Get to the Point processor will send a two-minute reply using a polite, digitized replica of your voice in a pleasant and deferential tone.

Finally, there's a newly announced addition to the virtual reality marketplace. Billed as Virtual Telecom, this helmet-and-glove configuration, when attached to a Reduced Instruction Set Computer-based server, can simulate the extreme experiences — both bad and good — of being a network manager.

Just put on the helmet, don the gloves, pull down the visor and have a colleague select an experience from the server menu. The experiences that come with the package include: Presenting Your PBX Recommendation to The Board, The Telecom Conference 1000 Booth Stare, Angry User Mob Scenes, Pointless Vendor Demonstrations and Career-Limiting Decisions Exercises.

The Virtual Telecom product provides visual, auditory and spatial representations of real experiences, which induce fits of nausea, anxiety attacks and occasional delusions of well-being. But users must be careful. Some scenes, especially those involving local- to wide-area network connectivity, will produce severe disorientation.

Worth Noting

"As far as I know, the easiest way to cross [international] boundaries is with E-mail."

James Metzger
General manager
Information Technology Department
Texaco, Inc.
Houston

World News

Communications Satellite Corp. recently announced a promotional 10% rate reduction for international, very small aperture terminal satellite services provisioned over the International Telecommunications Satellite Organization satellite system.

Users will receive a 10% discount for one year if they lease 5 MHz or less of bandwidth under COMSAT's Datanet tariff for four, five or seven years.

COMSAT officials said that 5 MHz of bandwidth can support about 3M bit/sec of digital capacity.

The current tariff for users that commit to lease 5 MHz of nonpreemptible Datanet bandwidth for four years is $15,775 per month. With the discount, users would pay $14,197 per month.

The smallest chunk of Datanet bandwidth users can lease from COMSAT is 100 KHz, which COMSAT officials said can support digital capacity of about 64K bit/sec. Users that lease 100 KHz of nonpreemptible capacity for four years pay $355 before the discount and about $320 after that.

COMSAT officials said they have two large international VSAT customers, Agencie-France, the French press agency, and Reuters Holdings PLC.

Additionally, COMSAT recently announced that Irving Goldstein, its chairman and chief executive officer, has been selected by INTELSAT's board of governors to become INTELSAT's director general.

Johnson & Johnson readies ISDN-based global video net

Videoconferencing effort will boost productivity.

By Ellen Messmer
Washington Correspondent

NEW BRUNSWICK, N.J. — Johnson & Johnson Corp. next month will launch a global videoconferencing network that will employ ISDN and other dial-up switched services to transmit data among sites worldwide.

Johnson & Johnson is installing the video network in an effort to reduce idle time spent by top executives in transit and to eventually communicate with customers and suppliers.

Initially, the consumer products and pharmaceuticals giant will link six international sites via 384K bit/sec links. Videoconferencing sessions will be established on the fly, with each site using an inverse multiplexer to signal local carrier switches to provide 64K bit/sec Integrated Services Digital Network circuits, which the mux then pools into a single connection.

"Travel costs are not a big issue to us," said John Sheahan, director of the Johnson & Johnson worldwide video network, during a recent Telecommunications Reports conference. "It's not the travel; it's how much [our executives] travel."

An internal survey of 48 executives revealed that 94% felt they had unproductive travel time ranging from one hour to more than 20 hours per week when in transit.

The company opted to use ISDN and other switched services because Johnson & Johnson executives are expected to demand instantaneous access to videoconferencing. Such a need makes switched services more desirable as a transmission means than the carriers' reservation-based videoconferencing services, which require advance notification, Sheahan said.

The first six videoconferencing rooms to go on-line next month will include Johnson & Johnson's U.S. headquarters here, Cincinnati, Hamburg, Germany, Sydney, Australia, and the Belgium cities of Beerse and Brussels.

Before commiting to a full-blown implementation, Johnson & Johnson will test the setup at those six sites. By the end of 1993, the company hopes to expand the net to 25 sites in the U.S. and 11 abroad.

The company's videoconferencing network is based on Compression Labs, Inc. (CLI) II-VP Option III coder/decoders and Ascend Communications, Inc. Multiband Controllers, which act as inverse muxes to pool ISDN lines.

Because foreign post, telephone and telgraph administrations require equipment to be certified for use on the national networks, Johnson & Johnson de-

(continued on page 18)

AT&T begins dialogue on Global SDN

By Barton Crockett
Senior Editor

CORAL GABLES, Fla. — AT&T recently met here with carriers from around the world to discuss development of new global virtual network services that would enable users to route virtual net traffic more easily between multiple countries.

The gathering was the first of what AT&T executives hope will be several conferences designed to improve AT&T's Global Software-Defined Network (SDN), the international version of the carrier's domestic virtual net service.

AT&T currently offers Global SDN service to ten countries, including Belgium, where service commenced last week. But AT&T's current Global SDN service is only a bilateral offering, meaning it can only be obtained on a point-to-point basis between the U.S. and a foreign country.

AT&T officials said they want to turn Global SDN into a multilateral service where users can obtain Global SDN features and functionality between the U.S. and multiple foreign countries. AT&T met with more than 30 carriers from 23 countries to discuss their views on this goal.

"The fundamental purpose of this session was for us to come together as a group to see if we could be more effective in introducing intelligent network services, particularly global virtual networks, in a mesh network," said Doug Macbeth, AT&T's group product manager for Global SDN and Switched Digital International service in Morristown, N.J.

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Major foreign stakes in U.S. service providers

U.S. service provider	Foreign investors	Stake of foreign investors	Value of foreign stake	Year acquired
McCaw Cellular Communications, Inc. Kirkland, Wash.	British Telecommunications PLC London	22%	$1.48 billion	1989
BT North America, Inc. (formerly Tymnet) San Jose, Calif.	British Telecommunications	100%	$355 million	1990
Cable & Wireless Communications, Inc. (formerly TDX, Inc.) Vienna, Va.	Cable & Wireless PLC London	100%	NA	1985
IDB Communications Group, Inc. Culver City, Calif.	Memotec Data, Inc. Canada	20%	NA	1989
World Communications, Inc. New York	Motor-Columbus, Ltd. Baden, Switzerland	100%	$56 million	1989
Infonet Services Corp. El Segundo, Calif.	Telecom Australia, Belgium's Regie des Telegraphes et Telephone, Deutsche Bundespost Telekom, France Telecom, Kokusai Denshin Denwa Company, Ltd., Netherlands PTT, Singapore Telecom, Swedish Telecom International, Compania Telefonica Nacional de Espana, Swiss PTT	75% combined total	$85 million (estimated)	1988 through 1990

NA = Not available

SOURCE: KOTEEN & NAFTALIN, WASHINGTON, D.C., AND *NETWORK WORLD*
GRAPHIC BY SUSAN J. CHAMPENY

Plan may melt icy views on int'l resale

FCC proposal would ease restrictions on resale of dedicated, switched services over private lines.

By Barton Crockett
Senior Editor

WASHINGTON, D.C. — The Federal Communications Commission recently proposed one regulatory change and adopted another that could encourage foreign countries to lessen restrictions on the resale of services via international private lines.

In one action, the FCC proposed a new rule that would limit the degree to which foreign-owned carriers are subjected to the same dominant-carrier restrictions as AT&T (see graphic, this page).

Observers said that if the proposal is adopted, it could ease trade disputes that have kept some countries, particularly the U.K., from allowing users to resell services via international private lines.

The FCC also said it will require all U.S. carriers to let users resell dedicated or switched services over international private lines if the country at the other end of the link permits resale. Currently, nearly every country prohibits international resale.

But FCC officials said the rule change will encourage foreign countries to allow international resale by offering them a guarantee that the U.S. will allow international resale if they do.

Currently, many U.S. carriers have tariffs that prevent users from reselling services over international private lines, even if regulators in the U.S. and abroad say international resale is allowed, the officials said.

FCC and industry insiders said users stand to benefit if foreign countries end prohibitions on international resale. Resale would enable users to sell excess private-line capacity to other users. Resellers could also dramatically undercut current international service prices by leveraging economies of scale from high-capacity private lines.

The savings could be particularly large for international switched services provided via private lines.

For example, an international resale analysis conducted earlier this year by *Network World* and the Washington, D.C.-based consulting firm Communications Network Architects, Inc. determined that a reseller could charge as little as 87 cents and still break even for a 4½-minute call routed from the public

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Plan may melt icy views on int'l resale

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switched net in Singapore over one of two T-1 lines to the public net in San Francisco.

By contrast, Singapore Telecom charges $17 for a 4½-minute call between the two cities. Resellers could also charge 93 cents for a 4½-minute call routed over one of two T-1s between London and New York, compared with British Telecommunications PLC's price of $5.17 and AT&T's price of $2.88 under its Global Software-Defined Network tariff.

Of the two FCC moves, industry observers said the first stands a greater chance of loosening resale restrictions abroad. This is because it addresses a major source of trade friction between the U.S. and U.K.

The U.K. was expected to be one of the first countries besides the U.S. to allow international resale since it said it would look favorably upon international resale as part of a major regulatory overhaul late last year. Legalization of resale between the two countries was expected to encourage other countries to allow international resale since the U.S.-U.K. route has one of the highest concentrations of international traffic in the world.

But thus far, the U.K. has stopped short of allowing full international resale to the U.S. Instead, the U.K. says users can resell dedicated capacity from international private lines and route traffic via dedicated private lines from the U.K. to other countries' public nets.

However, the U.K. does not allow users to route traffic over an international private line into the U.K.'s public network. Because of this inequality, the U.S. has not given any users or service providers permission to resell switched services via private lines to the U.K.

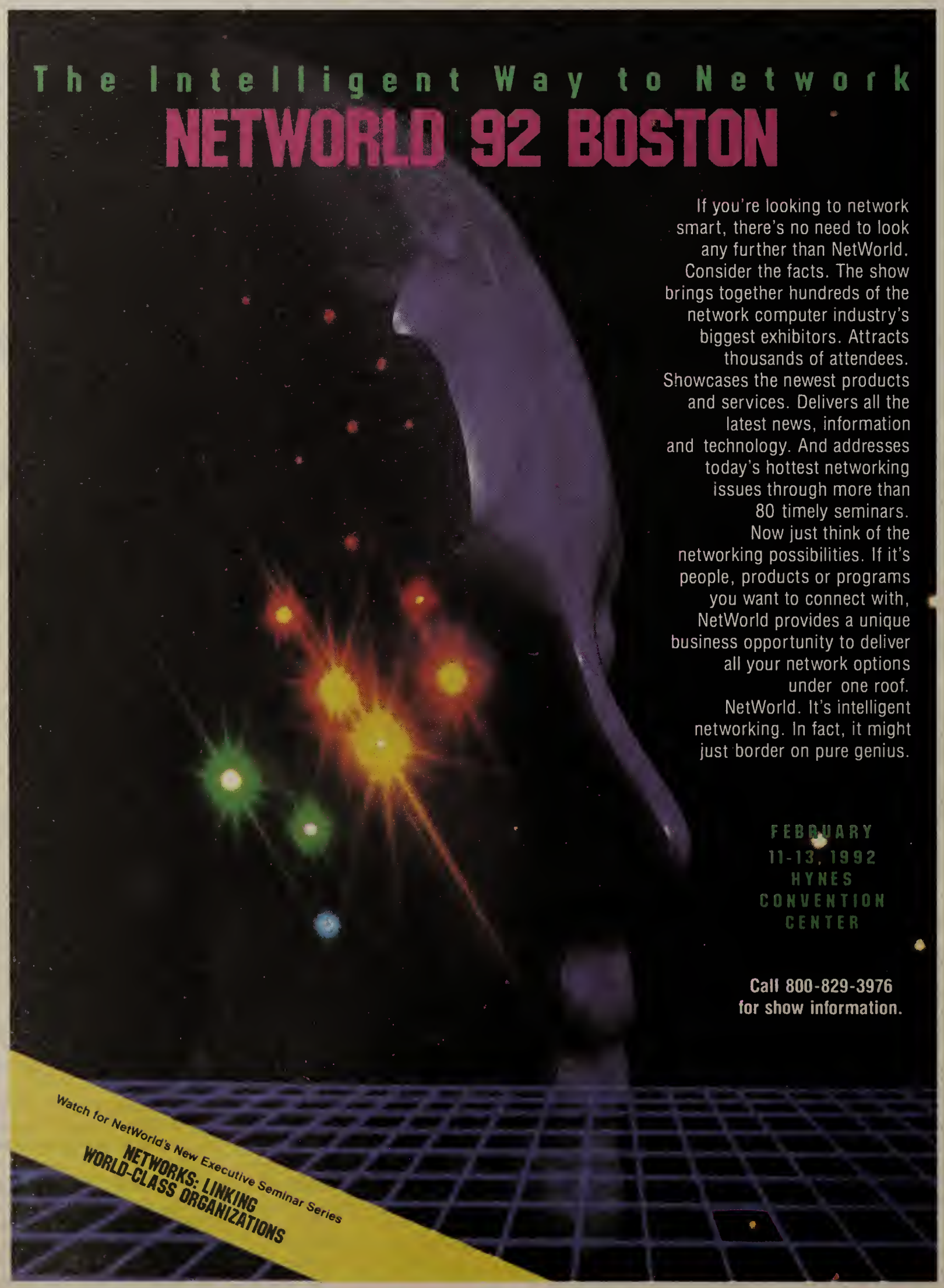
Gregory Staple, an attorney specializing in international communications with Koteen & Naftalin, a Washington, D.C. law firm, said one reason the U.K. has stopped short of allowing unrestricted international resale is it believes that the U.S. government restricts the ability of U.K. carriers to compete in the U.S. market.

One sticking point is U.S. regulations that require foreign-owned carriers to face the same strict tariff filing and revenue reporting requirements as AT&T for all international services.

British-owned carriers have opposed these restrictions. In its recent proposal, the FCC said it would like to drop the foreign-owned carrier restrictions, except when those carriers provide services to countries where they enjoy a monopoly.

Staple said this change could be enough to convince the U.K. to end all restrictions on international resale to the U.S.

"It's possible that this could break the logjam on international resale," Staple said.



Firm readies ISDN global video net

continued from page 17

cided that vendor presence in foreign markets to support and certify the equipment abroad was an important factor as well.

Johnson & Johnson determined that Ascend and CLI were making strides in establishing a presence abroad and receiving foreign certification.

Robert Richards, a Johnson & Johnson network consultant in the corporate net services division, said the use of switched digital services is expected to be far more flexible and economical than private-line service. The company chose AT&T's switched digital services because the carrier seemed to lead the market, he added.

Johnson & Johnson already uses AT&T for other services, such as Software-Defined Network and Accunet Reserved. Through Accunet Reserved, the company can access the carrier's national and international public videoconferencing rooms, as well as the US Sprint Communications Co. Meeting Channel public rooms, through a gateway.

Richards said the corporation decided to use ISDN access in conjunction with the switched digital services because ISDN is available in the U.S. and Europe.

Use of ISDN allows Johnson & Johnson to skirt differences in transmission speeds between other U.S. and European services.

"If we did not use ISDN, we'd [need] a speed conversion service," Richards explained. He added that ISDN provides fast setup time for a call, which is plus.

AT&T begins Global SDN dialogue

continued from page 17

Based on the interest expressed at the meeting, Macbeth said he believes that the carriers will eventually agree to roll out multilateral global virtual network services. It will probably take more than several months to do this, he added.

US Sprint Communications Co. already offers a multilateral global virtual network service, called Global Virtual Private Network, with carriers in Canada, Hong Kong, Japan, the Netherlands and the U.K.

Empresa Brasileira de Telecommunicacoes S.A. (Embratel), Brazil's national long-distance carrier, was one of the carriers that attended the meeting. AT&T plans to commence Global SDN service with Embratel in the first quarter of next year. Other potential Global SDN partners also attended the meeting, including representatives of carriers in Germany and Mexico.

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Firm enhances NetWare document control system

PC DOCS, Inc. recently announced an upgrade to its Novell, Inc. NetWare-based document management product that provides additional search and security features as well as network management capabilities.

PC Document Organization & Control (DOCS) Version 4.0, like the previous version, is software consisting of a graphical user interface that resides on any IBM Personal Computer, PC AT, Personal System/2 or compatible running DOS 3.3 or above and a document database designed to run on a NetWare 286 or 386 server.

With the software, users are prompted to fill out a document report each time they store a newly created document. This information is appended to the document, which is then stored on the server in a library. The library indexes and stores every document from a particular work group, enabling users to search archived documents by name, date of origin, creator and subject.

In the new version, PC DOCS has expanded the search capability so users can automatically search several libraries residing on different servers in a wide-area network. Previously, users needed to log on to a separate local-area network to retrieve remote documents. The updated product also enables users to retrieve the last 20 documents they worked on with a single keystroke.

In addition, Version 4.0 lets users assign security levels to documents and place them in secure directories. It also offers a document transfer feature.

Version 4.0 contains an Activity Log that, like the previous version, maintains an audit trail of all transactions, such as edit and print sessions, but now also tracks files that were viewed, copied or placed on a diskette for off-line editing.

Version 4.0 of PC DOCS is available now and is priced at $225 per workstation.

PC DOCS, Inc., 124 Marriott Drive, Suite 203, Tallahassee, Fla. 32301; (904) 942-3627.

Firm offers LAN package for imaging

By Joanne Cummings
Staff Writer

WESTBROOK, Conn. — Westbrook Technologies, Inc. recently unveiled a version of its imaging software that runs on personal computer-based local-area networks.

The product, ImagicLAN, enables LAN-attached users to scan documents into a server supporting an image database and retrieve them by issuing file requests from any client workstation on the LAN.

ImagicLAN is software that consists of a Microsoft Corp. Windows workstation-based graphical user interface, optical character recognition (OCR) software and a server-based image database engine. It works in conjunction with any Server Message Block-compliant LAN operating system, including Novell, Inc.'s NetWare, IBM's PC LAN, Banyan Systems, Inc.'s VINES and Microsoft's LAN Manager.

Until now, the software was only available for stand-alone workstations.

ImagicLAN uses OCR technology to index, store and retrieve files from the server-based image database. According to Michael Graham, Westbrook's vice-president, ImagicLAN users can retrieve a typical page of text in less than one second.

The database accepts files in ASCII, TIFF or PCX formats as well as Group III and Group IV facsimile formats. The scanner can be attached to either a workstation or a server, Graham said.

When an image is scanned into the database, users can employ the product's OCR capabilities to capture key words or phrases from the document for indexing. These are stored with the image in the ImagicLAN database, enabling users to search the database and retrieve images based on these key phrases. A typical page of text takes up about 65 bytes of memory, according to Graham.

ImagicLAN does not support full-page OCR capabilities, although the company plans to offer this feature by next spring, Graham said.

ImagicLAN is available now. It costs $1,895 for a single-server unlimited-workstation license.

For more information, contact Westbrook at 22 Pequot Park Road, P.O. Box 910, Westbrook, Conn. 06498, or call (203) 399-7111.

AT&T unwraps options for videoconferencing services

By Ellen Messmer
Washington Correspondent

BASKING RIDGE, N.J. — AT&T recently introduced enhancements to its videoconferencing services that provide users with better interoperability between their equipment and the carrier's services.

AT&T announced it now supports a multipoint conferencing feature on its Accunet Reserved Digital Service, Switched Digital International and AT&T Switched Digital Services (SDS).

This will enable customers to link users at as many as 14 sites into a single interactive videoconference.

The carrier said new coder/decoder conversion services will enable users to employ different brands of video codecs and variable transmission speeds in the same videoconference.

Lastly, AT&T announced that its Accunet Reserved Digital Service is compatible with Switched Digital International, SDS and Software-Defined Data Network (SDDN) off-net services.

"To communicate, our customers no longer need to be concerned about which AT&T service, codec or speed they are using. We will handle it all for them," said Glenn Riggin, general manager of AT&T's Global Business Video Services.

AT&T said it will now provide multipoint dial-up videoconferencing at as many as 14 locations for customers using its Switched Digital International Service at 56K and 64K bit/sec. By dialing an 800 number, customers can link international sites into the videoconference.

AT&T will also support multipoint videoconferencing speeds of 384K, 768K and 1.5M bit/sec.

AT&T will provide codec format and speed conversion at 56K, 64K and 384K bit/sec for Accunet Reserved and Accunet SDS as well as SDDN customers.

AT&T said the multipoint conferencing option is available now and costs $1 per minute for each site connected into the conference. Likewise, the optional codec conversion services are available now for $1 per minute for each site.

RISC router caters to Macs in Ethernets

Compatible Systems unit routes native AppleTalk protocols and provides IP services to Mac users.

By Joanne Cummings
Staff Writer

BOULDER, Colo. — Compatible Systems Corp. last week unveiled a Reduced Instruction Set Computer (RISC)-based router for Apple Computer, Inc. Macintoshes running on Ethernet local-area networks.

The company's RISC-Router 3000E is a stand-alone device capable of routing AppleTalk protocols among Macintosh systems on different LANs or acting as a gateway that provides Internet Protocol services to AppleTalk users on a LAN.

The device can be used to isolate Macintosh work groups from other traffic on an Ethernet backbone, said Matt McConnell, president of Compatible Systems.

It also supports AppleTalk tunneling, meaning it can encapsulate AppleTalk data in Transmission Control Protocol/IP or Digital Equipment Corp. DECnet packets for transmission across a TCP/IP or DECnet backbone.

RISC functionality

The RISC-Router 3000E uses a 25-MHz RISC microprocessor based on MIPS Computer Systems, Inc.'s R3000A RISC architecture.

The RISC capability will enable the router to determine network routes and quickly process network protocol information, including AppleTalk, TCP/IP and DECnet data.

> The device can be used to isolate Macintosh work groups from other traffic on an Ethernet backbone, McConnell said.
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The device includes 1M byte of random-access memory, upgradable to 16M bytes, for buffering network packets. It also has 256K bytes of flash memory, which enables the device to automatically accept routing software upgrades, McConnell said.

The unit comes with two Ethernet ports, each of which can be configured to support thick- or thin-wire Ethernet.

In TCP/IP networks, the RISC-Router 3000E supports the management of static and dynamic IP addresses for Macintosh computers running Apple's MacTCP software. It also supports the Simple Network Management Protocol, Apple's atalkad router administration protocol and the Router Information Protocol.

> It has 256K bytes of flash memory, which enables the device to automatically accept routing software upgrades.
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McConnell said the 3000E can function as a local router, filtering and forwarding packets from a local Macintosh work group to a work group located across an Ethernet backbone.

The device can also function as an IP gateway, allowing users to position it to accept data from AppleTalk devices. In this manner, the unit can strip off the AppleTalk protocol to reveal underlying IP address information for routing across a TCP/IP backbone.

Support options

The company said it plans to include features in the RISC-Router 3000E that it originally developed for its line of LocalTalk-to-Ethernet routers. These include support for the Enhanced Network Security protocol, which provides for password protection for the device, as well as support for Macintosh-based management software that provides network diagnostic and configuration capabilities for the device.

The RISC-Router 3000E is scheduled to ship in the second quarter of 1992 at a cost of $2,995. In comparison, the Cisco Systems, Inc. IGS router costs about $5,000.

For more information, contact Compatible Systems at P.O. Box 17220, Boulder, Colo. 80308, or call (303) 444-9532.

OPINIONS

NETWORK COMPUTING

BY DAVID CRAWFORD

When network managers walked the earth

The following is an excerpt from the college textbook In Search of the Missing Data Link, *published by the Interplanetary Data Group in the year 2614. It tells what archaeologists found when they tried to reconstruct the history of computer networking.*

When we examine the fossil records at the end of the Paleo-Digital era, when the giant mainframes were becoming extinct as a species, we see a period of rapid change. Many transitional species evolved quickly and flourished briefly, only to follow the mainframes into extinction.

One of the most interesting of these transitional forms was the primitive network manager (Homoconnectus). This species appears to have evolved from the microcomputer specialist and spread throughout the computing environment, forging communications links between computers large and small.

> Net managers were hardy and adaptable creatures — generalists in a world of specialists.
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During the Paleo-Digital era, it was not uncommon for network managers to be buried alive in their offices beneath an avalanche of documentation and interface boards. There they were preserved, along with their cultural artifacts, as perfectly as if they had been buried in volcanic ash. Excavation of such sites has given archaeologists a wealth of information about the everyday life of this species.

Network managers were hardy and adaptable creatures — generalists in a world of specialists. Based on the wide variety of products found in their offices, we can deduce that they had an omnivorous appetite for hardware and were able to digest even the most bug-ridden software.

Net managers were intelligent enough to master the use of tools, but they may have had too many for their own good. Everything from hardware tools such as cable crimpers and time-domain reflectometers to software aids such as protocol analyzers and sophisticated debuggers can be found cluttering the shelves of their habitat. This variety of tools tells us that the network manager was quite often the network installer, troubleshooter, programmer and trainer as well as janitor.

We can only speculate about the spiritual beliefs of these primitive net managers. The technical manuals they left behind appear to be religious in nature and refer to long-lost gods with names such as SNA, TCP/IP and OSI, but these volumes are too ponderous and obscure for modern scholars to understand.

In spite of their ingenuity and adaptability, Homoconnectus vanishes from the fossil records as a distinct species in the Meso-Cybernetic era, only a few years into the 21st century.

A few scholars believe that network managers became extinct because of the stress induced by supporting ever-larger numbers of baffled end users, while others believe they perished when the Great Unix War, which had been simmering since the 1980s, escalated into a global thermonuclear conflict in the year 2064.

But the most widely accepted theory for the disappearance of Homoconnectus is that network managers merged with the mainstream of computing and lost their identity. This is consistent with the observation that in the 21st century, the phrase "network computing" lost its meaning because, by then, there wasn't any other kind of computing. ◘

Crawford, a prime example of Homoconnectus, is a network coordinator at California State University in Northridge.

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EDITORIAL

Networking could help prevent future recessions

The networking community has felt the impact of the current recession. And so, as U.S. unemployment continues to inch higher this holiday season, it seems worthwhile to ask whether networking could play a role in combating future recessions.

We think so — but only if companies use their networks to really transform the way they do business. When U.S. companies can produce the goods that Americans need without layers of unneeded managerial intervention, our economy will be resistant to recession.

But economists are saying that information technology has had little positive effect on the U.S. economy thus far. A recent article in *Computerworld*, another International Data Group publication, noted that, although the U.S. spends more per capita on computers than any other nation, the growth in productivity of the average U.S. worker continues to decline.

In that article, Gary Loveman, assistant professor of economics at Harvard Business School in Cambridge, says, "There is not any evidence that information technology is improving productivity or other measures of business performance."

Why haven't networks helped improve national productivity? One reason, Loveman notes, is that companies can't measure the benefits they derive from purchasing information technology, so they usually buy networked equipment on departmental recommendations without a corporate plan for using it to transform the organization.

Another factor is that many of today's networked applications are less than user-friendly. Thus end users rarely utilize them to their full potential.

But the major reason networks have yet to improve U.S. productivity is because they frequently are not used strategically. As a *Harvard Business Review* article of a few years ago stated, "We should use the power of modern technology to radically redesign our business processes in order to achieve dramatic improvements in their performance."

To make these dramatic improvements, network managers must work closely with top management to use new technology to achieve radical gains in productivity. They must also help end users understand the network's capabilities and use them to their fullest potential.

So here are two suggested New Year's resolutions: Make your network more of a strategic tool, and make it easier to use. The cumulative effect of many companies doing this could turn the economy around and make it resist future recessions. ◘

OPINIONS

DISTRIBUTED COMPUTING

BY JOHN RYMER

Users will see red, not 'Pink,' in future PC applications

The communications industry has become infatuated with next-generation personal computer operating systems. Witness the hullabaloo over Microsoft Corp.'s Windows NT and the operating system that IBM and Apple Computer, Inc. are developing based on Apple's internal Pink project. These new PC operating systems are supposed to usher in an era of multitasking, sophisticated memory management and integrated distributed computing facilities.

Despite the fact that Novell, Inc.'s NetWare is well on its way to being the most pervasive interconnect platform for all sorts of operating systems, it is typically left out of these discussions. That is a mistake. In my opinion, NetWare will be at the center of the next operating system decision users must make.

The creators of next-generation operating systems make three overly optimistic (or false) assumptions. The first assumption is that users will have to switch to new operating systems to meet the application needs of the mid-1990s. Thus, fans of IBM's OS/2 Version 2.0 are confident that it will supplant Windows 3.0 and DOS.

However, with the improvements of Windows 3.1 and subsequent versions, Microsoft will demonstrate that new facilities can be rolled into today's platforms over time. The same is true of Sun Microsystems, Inc.'s SunOS and other platforms that are dominant today.

Given the reluctance of corporate systems builders to suffer the pain of transition to a new platform, I foresee slow growth for the new operating systems, such as Windows NT and Pink.

The second false assumption that next-generation operating systems vendors make is that once users select a new operating system, they'll want to make it their single standard on many hardware platforms and computers of various sizes and configurations. Unfortunately, most large organizations have too many independent decision makers with computer budgets to dictate single standards. Diversity is, and will be, the rule.

The third false assumption is that a single vendor can satisfy user requirements for advanced functions such as support for multimedia distributed computing and object-oriented software construction. This is an unrealistic expectation even for IBM.

> What we need is "glue" to allow applications to work together.
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Users do need continually advancing operating system technology. They don't need the hype and wishful thinking they're currently getting about operating systems. Given that diversity will be the rule in operating systems, what we need is "glue" to allow applications on different operating systems to work together. There can be many operating systems with advanced functions if the glue between them is consistent.

NetWare is now the leading contender to be the glue between diverse operating systems. Novell supports all of the major client platforms and is rapidly moving to support all sorts of servers. Its recent deal with Hewlett-Packard Co. to port NetWare to HP's strategic servers is the latest in a series of such arrangements that I expect will continue. IBM will be next.

Novell is working to not only get NetWare onto many conventional servers, but also to get it onto fault-tolerant computers and other specialized platforms.

At the same time, the company has assembled a stable of interconnection software for IBM's Systems Network Architecture and other major networking protocols. Novell is well on its way to making NetWare pervasive.

Vendors of the advanced operating system platforms would like to see their products play the dominant role of distributed and interconnect platform. Microsoft and IBM have tried this with OS/2 and LAN Manager.

However, the keys to success in the interconnect business are performance and support of platforms. NetWare beats LAN Manager on both scores and will continue to do so for some time. Novell will be able to support users seeking advanced functionality from many operating system platforms — old ones, new ones, open ones and proprietary ones. When the next-generation operating systems arrive, Novell will help integrate them into existing environments.

Don't get me wrong: NetWare is not perfect. Novell has yet to create optimal client/server application development facilities for NetWare. Most developers I've talked to say LAN Manager makes a better client/server application development platform than NetWare.

Novell also hasn't delivered a good network management platform yet, but it plans to fill this gap soon. In addition, it has to shore up NetWare's distributed security features.

Finally, Novell hasn't enjoyed success in its support of protocols it doesn't own. For example, early users of Novell's Transmission Control Protocol/Internet Protocol products reported reliability problems.

Still, the way I see it, the interconnect game is Novell's to lose. If the company does right by users, the most important operating system in the next generation of applications will be Novell red, not Pink.

Rymer is editor in chief of Patricia Seybold's Network Monitor *and vice-president of Patricia Seybold's Office Computing Group in Boston.*

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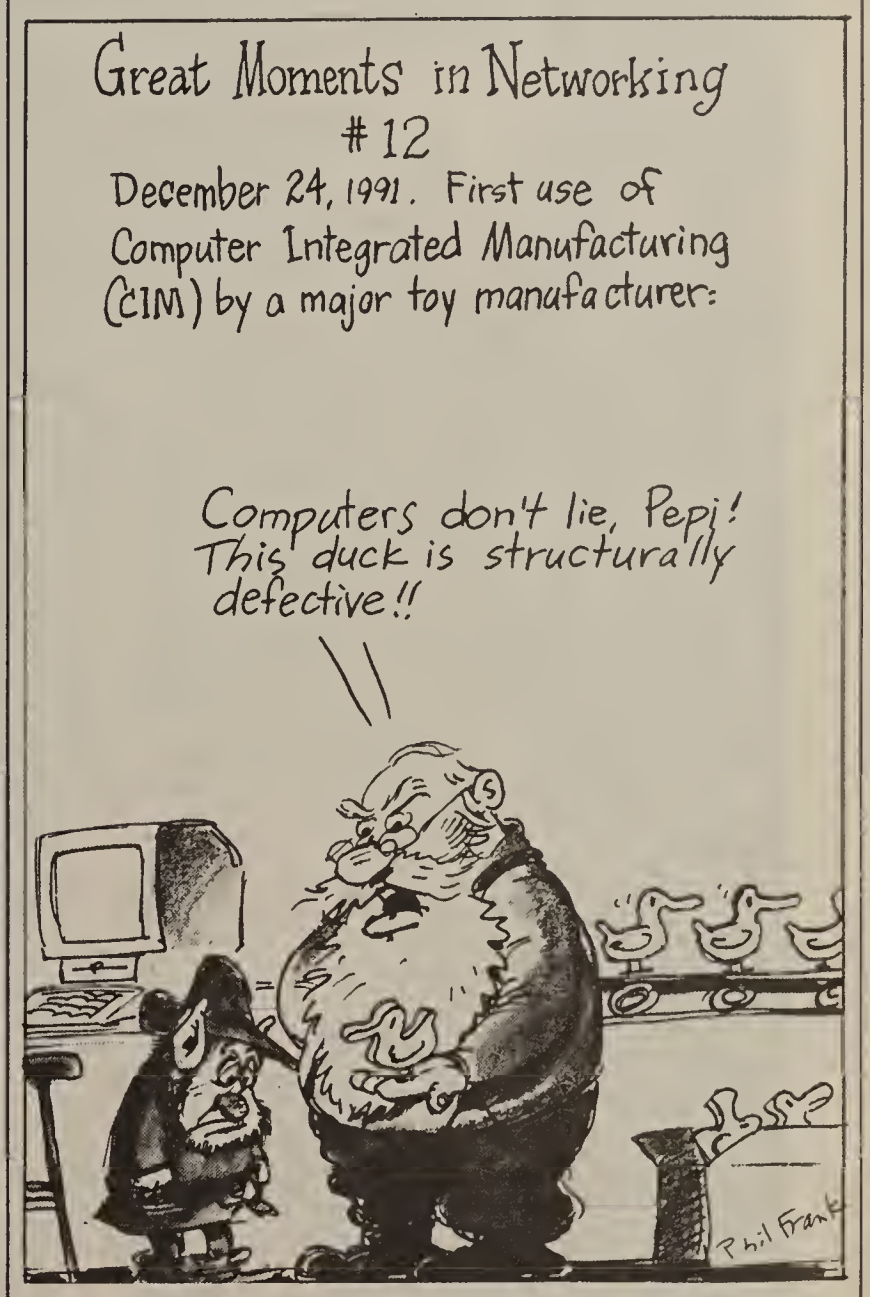
TELETOONS

BY FRANK AND TROISE



A time for reflection

One of the real pleasures of the holiday season is renewing ties with family and friends, toward whom we are often guilty of a benign neglect. The holidays have a way of reminding us of these ties, which we ought to celebrate throughout the year.

As 1991 ends, we'd like to celebrate our ties with you, our readers. With your support, *Network World* has become the leading publication serving network executives. To meet the demand for information about the strategic use of network technology, we doubled our circulation early in the year.

Now we're helping even more readers with the tough job of building enterprise nets. We're serving more advertisers and enjoying a heightened visibility in the industry, as well.

So we want to stop for a moment to thank you for your loyalty. We know you receive as many as a dozen publications, each addressing some facet of the marketplace. Yet in surveys of top net executives, *Network World* consistently ranks at the top of your reading list. And for that, we want to thank you.

Sound corny? Maybe. But we're pleased to have built a real partnership with our readers and the advertisers that want to reach them.

But we don't work in a vacuum. With your insights, we've been able to design a publication that provides you with timely news and the analysis to help you understand the forces shaping the industry.

Through your telephone calls, letters, electronic mail, and our own surveys and focus groups, you've told us how we can help you do your jobs.

When we're off the mark, you let us know it. But we also have the pleasure of your praise when we're on target.

Based on your input, *Network World* will continue to evolve in 1992 with new features designed to help you maximize the potential of network technology.

From the staff of *Network World,* happy holidays and best wishes for 1992. Thanks for reading us. And keep in touch.

ILLUSTRATION ©1991 KEN CONDON

The case for network modeling

CONTINUED FROM PAGE 1

mance before they have to buy hardware or transmission services.

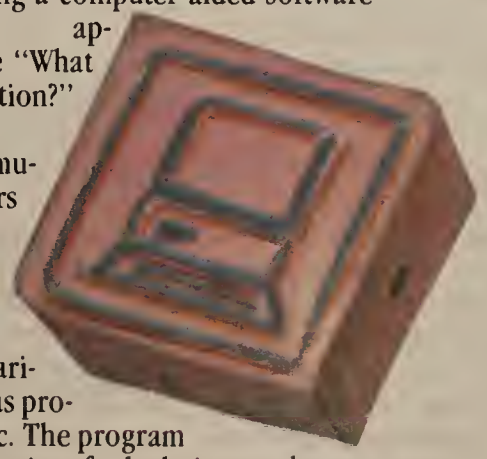
These design and optimization tools run on a wide variety of systems, from DOS-based microcomputers and Unix-based workstations to powerful supercomputers.

There is also a wide range in their prices. At the low end are modeling tools that cost less than $1,000, such as InternetiX, Inc.'s SoftBench and the University of Michigan's NetMod, both of which establish performance benchmarks but do not go into detail at the protocol level.

At the high end there are simulators that mimic a configuration's performance. Prices for these products range from $10,000 to upwards of $20,000. Included in this category are Scientific and Engineering Software, Inc.'s SES, CACI Products Co.'s LANNET II.V and Network II.V, InternetiX's LANSIM, Comdisco Systems, Inc.'s Block Oriented Network Simulator (BONeS) and MIL 3, Inc.'s Optimized Network Engineering Tools.

> Users seek easy-to-use modeling and simulation tools to build better networks.

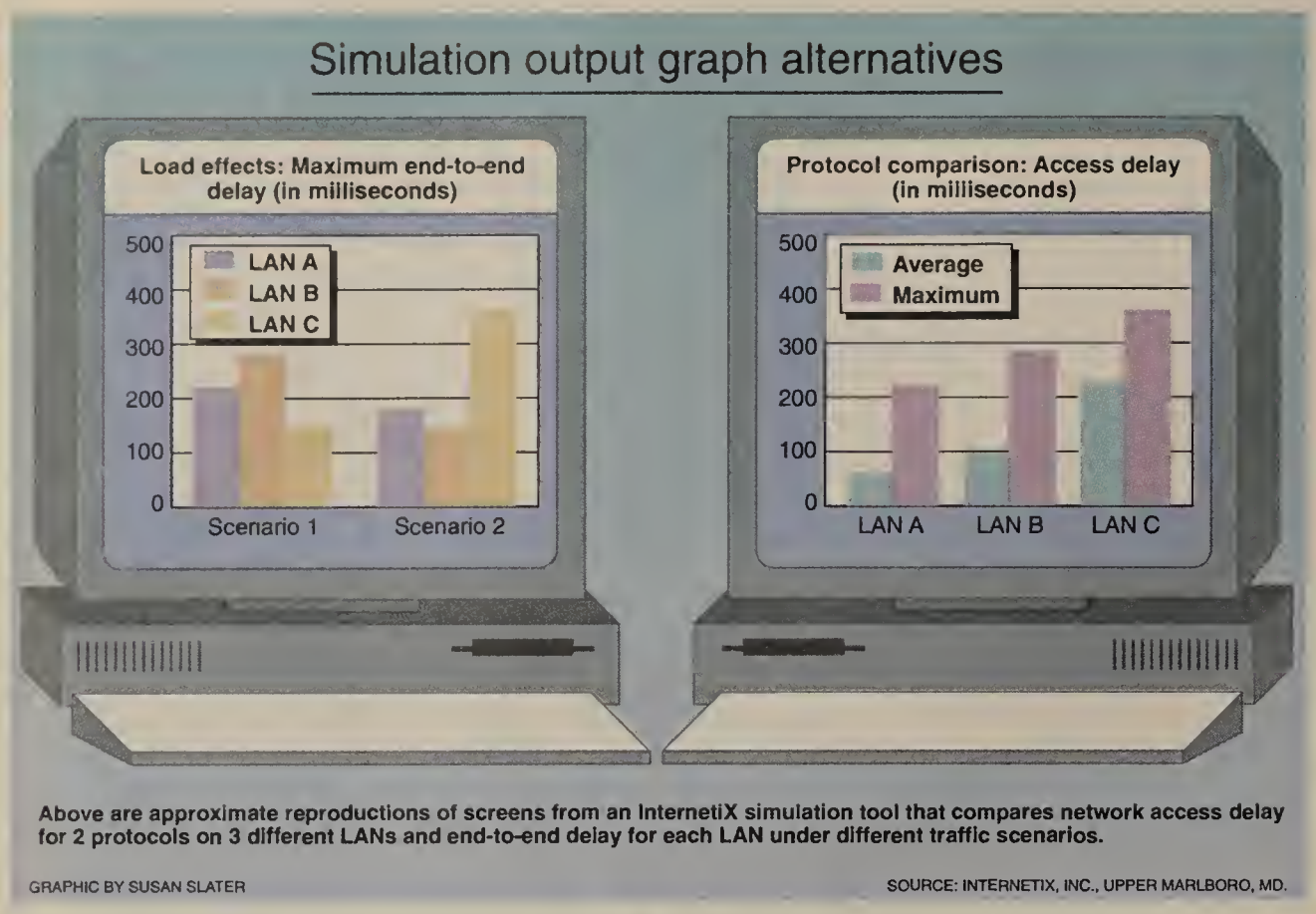
In a related category are tools such as Make Systems, Inc.'s NeTool, which simulates specific vendors' bridge and router devices using an approach similar to computer-aided engineering, and Advanced Systems Technologies, Inc.'s Quantitative Aided Software Engineering (QASE), which simulates the performance of individual software packages on specific hardware systems using a computer-aided software engineering approach (see "What is simulation?" page 24).



With simulation, users enter network configuration data and other variables, such as projected traffic. The program then runs a series of calculations and plots the results to produce a chart with time on one axis (usually in milliseconds) and the value of a selected variable on the

(continued on page 24)

Cope is president of M/R Consulting Company, Inc., a Seattle-based marketing research and consulting firm specializing in data communications. She also directs research projects for Frost & Sullivan, Inc., a market research firm in New York. Cope can be reached at (206) 382-1420.



Above are approximate reproductions of screens from an InternetiX simulation tool that compares network access delay for 2 protocols on 3 different LANs and end-to-end delay for each LAN under different traffic scenarios.

GRAPHIC BY SUSAN SLATER

SOURCE: INTERNETIX, INC., UPPER MARLBORO, MD.

(continued from page 23)
other (see graphic, this page).

Anyone downsizing to distributed processing, putting new applications on a LAN, interconnecting LANs or undertaking any of the numerous changes that are part of a network designer's or manager's everyday life is a candidate for one of these tools (see "Why use modeling and simulation?" page 25).

However, some users have not tried these tools because they believe they're too complicated, too expensive or simply unnecessary. Others who have tried them say the savings in hardware costs and network downtime are well worth the cost and effort of learning how to use them.

One user's experience

Rayner Rosich, a laboratory scientist at the Colorado Engineering Laboratories of Hughes Aircraft Co.'s Space and Communications Group in Aurora, Colo., used Comdisco's BONeS to improve performance in an internal user group's existing campus internetwork of 770 workstations.

The user group had performance problems when it tried interconnecting its various LANs for a completely automated, mission-critical design and manufacturing system.

The hierarchical design of the internetwork had subnetworks of engineering and office workstations linked to one of seven Ethernet 10Base-T hubs, each of which was connected via a bridge to a 100M bit/sec Fiber Distributed Data Interface backbone. The user organization wanted to keep the net's design and use standard bridge and router products, Rosich says.

The Hughes team used BONeS to find out what number of workstations per subnetwork and total number of subnets would be optimal. The group determined that the Ethernet networks were the real bottleneck and that there was a limit to how many workstations could be put on the bottom layer of this hierarchical design.

Simulation also dictated which bridge vendors to select. Although the vendors' specifications for buffer memory appeared to be comparable, Rosich's team ran simulations that showed the advertised specs were not always true.

Hughes simulated pairs of subnets with a bridge between each pair and measured the packet-per-second forwarding rate for various sized packets. Buffer memory turned out to be an important parameter for this network, and about one in five vendors incorrectly stated the buffer capacity of one of its bridges.

"We would have gotten to the same answers eventually by cutting and pasting equipment," Rosich says. "But by building a model of the real system, we could use the same trial-and-error approach without buying and installing equipment. We saved about three to six months of work and hardware money, and the users would have been unhappy during that time."

Rosich's team also used simulation for capacity analysis, putting the current traffic in the model and adding more traffic until it exceeded the capacity threshold.

In addition, the group simulated the effect of running a new network management system, which generates considerable traffic from its location on one of the seven Ethernet hubs. Congestion at its connection point to the hub could conceivably bring the system to its knees.

By testing for network management traffic at that connection point, the team knew how much additional, nonmanagement traffic could be run through that hub and how much to direct to the other six hubs.

What's the problem?

Will such tools ever become a vital part of the network professional's tool kit? That depends on the network, its size, the applications that run on it and the extent to which it mixes different types of LANs. Scott Haugdahl, a consultant at Architecture Technology Corp. in Minneapolis, suggests these rules of thumb, "If you have five or six nets interconnected, you need tools," he says. "And if performance becomes a problem, start looking for tools."

But waiting until performance becomes a problem can create a problem in itself, according to network consultants.

Unprepared net managers wait until the network slows down and then throw in another router or T-1 line. They respond to panic calls from end users, rather than anticipating and planning for changes in network performance. In addition, they may try to protect themselves through design overkill.

"They don't realize how big a pipe they're working with," says Rich Seifert, president of Networks and Communications in Cupertino, Calif. "They overestimate their average network loads. Their peaks, measured over a period of one minute, maybe have a 40% load for the worst minute of the day.

"They don't understand the differences between the applications that do overwork the network, such as diskless workstations and [Digital Equipment Corp.] local-area VAX clusters, and those that don't, which are the bread-and-butter applications such as office automation on PCs," Seifert says.

On those relatively simple office applications, "you could take out 10M bit/sec and put in 1M bit/sec, and no one would notice the difference," he adds.

If some network managers are indeed simply throwing more hardware and circuits at problems as they arise, how will they cope with the major changes under way in networking concepts? "The job of the network manager has changed so radically in the last 10 years, it is hardly definable any more," says Richard Gilbert, vice-president of research and development for Make Systems in Mountain View, Calif.

Where networks were once static, they are now dynamic. Local segments are getting smaller to provide adequate bandwidth for increased traffic. Users are more geographically dispersed, yet they expect access to information regardless of location. New

What is net modeling and simulation?

Some network professionals use the terms network modeling and simulation interchangeably, while others try to distinguish between them. But one thing is clear: Modeling and simulation software tools can help determine the performance payoffs for specific network designs.

The tools can also help determine if new technologies such as Switched Multimegabit Data Service, Synchronous Optical Network and frame relay will improve the performance of existing networks, says Rayner Rosich, a laboratory scientist at the Colorado Engineering Laboratories of Hughes Aircraft Co.'s Space and Communications Group in Aurora, Colo.

In modeling, users build a network prototype, or benchmark. Simulation tools depict the effects of changes over time to a network's physical topology, protocols or traffic.

With simulation tools, users can cast the dependent variable they want to measure — such as end-to-end delay — against selected independent variables that affect traffic levels. These might be the number of users on the net, the protocol stacks implemented or the characteristics of different bridges and routers.

After the data has been entered, the simulation program plots the results and projects the dependent variable's value. The usual representation is a chart with time (in milliseconds) on one axis and the value of a dependent variable on the other axis (see graphic, this page).

Simulation is a set of statistical processes that enable users to explore complex interactions of variables, though each variable added to the model has its costs. The more detailed the simulation model, the more accurate the results. But higher levels of accuracy require more time and expertise to develop and run the model, as well as to interpret the results.

For most net managers without engineering backgrounds, the time and expense required to learn how to use these detailed simulators is too great. According to Rosich, the minimum time it takes to build a detailed model is two to three months.

Different types of simulation tools are suited to a wide-area network or LAN environment. WANs are simulated with continuous mathematical models based on differential equations. In contrast, simulation tools suited to the LAN environment are driven by discrete events in network traffic represented by packets.

For example, LAN Node 1 releasing a token and LAN Node 2 receiving a token are defined as two discrete events. Event-driven simulators advance the state of the model by these event steps and compute performance under a specified traffic load. In effect, these models step time from one event to another.

High-end simulators such as Comdisco Systems, Inc.'s Block Oriented Network Simulator and MIL 3, Inc.'s Optimized Network Engineering Tools focus on building detailed models of network protocols or devices such as bridges and routers.

Low-end simulators such as InternetiX, Inc.'s LANSIM, Advanced Systems Technologies, Inc.'s QASE and CACI Products Co.'s Network II.V sacrifice flexibility and power for simplicity. They use predefined variables with some measure of customization. While adequate for individual LAN segments, these products may not have the horsepower or scalability for more complex LAN-to-LAN or LAN-to-WAN simulation.

Vendors are moving into the LAN interconnect simulation market with tools based on modular plug-and-play elements.

Because traffic is unique to each user, vendors face the challenge of modeling to each user's reality. At the same time, they must make it easy for users to represent their networks. This dictates that vendors build modular libraries of various network devices and applications from which users can pick and choose the appropriate elements.

One of the more time-consuming but highly important tasks in simulation is collecting network data to plug into a model.

Vendors are simplifying this task by incorporating features that let users import and use real transaction data, captured from their own networks with popular LAN analyzers such as Network General Corp.'s Sniffer and Novell, Inc.'s LANalyzer.

— Patricia Cope

network-based applications are being deployed, some of them critical to the success of the business. These changes are relentlessly constant. Traffic patterns are unpredictable and subject to change, as projects come and go and organizations restructure. Traffic levels are unpredictable, creating irregular but very heavy peak loads and leaving underutilized capacity much of the time.

Adding new and more powerful workstations and servers running bandwidth-intensive applications such as imaging to the network will further skew the peak-to-average ratios, especially when an image transmission increases traffic.

Developments such as 100M bit/sec FDDI over twisted-pair wiring to the desktop will also affect the ratio because it will tempt users to add bandwidth-intensive applications that may have sporadic, rather than steady, transmission patterns.

In addition, bandwidth-on-demand technologies will skew the ratio by bringing change on the order of seconds, not hours, as networks automatically expand and contract available bandwidth in response to traffic demands.

Who's in control?

These changes will challenge network professionals to gain better control of their networks. But users ultimately control the network, not net managers, because users determine the applications they want.

Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc. in Boston, says she believes users' needs are changing so rapidly that net managers can't keep up. She says that's because "network designers are not connected to the people doing application development."

That view is confirmed by Steven Kreiter, a remote network manager for the state of Washington's Department of Health in Olympia. He admits to experiencing growing pains in creating a distributed network to support new applications, each with its own requirements for access by other departments and agencies.

For example, a new and closely watched client/server application for the department's Sexually Transmitted Diseases Group needs high security to protect patient confidentiality yet must be accessible to other groups within the department.

"For the first time, programmers, users and net managers are sitting down together" to design and implement discrete application servers and develop plans to interconnect them, Kreiter says. "We can't keep growing from the middle out from our headquarters backbone."

As the network grows more complex, Kreiter foresees the need for tools that will help predict the impact of new applications on the network.

Simulation and modeling tools can help make those predictions. Peter Stephenson, vice-president of Stephenson and Associates in Rochester Hills, Mich., used SoftBench to grow a 65-user token-ring internetwork to a 1,000-user net in five months, with design changes along the way. He used the tool to create what-if scenarios at the initial design stage and at later stages of design validation. "When everything was plugged together, it worked out of the box," he says.

Stephenson now uses SoftBench to validate network performance each time a new subnet is connected to the internetwork, which will eventually reach more than 10,000 users.

However, the ability of SoftBench to predict heavy traffic loads is limited, Stephenson says. He admits to getting a little nervous using it for a network of more than 1,000 nodes, where a high-end simulation tool would allow more detailed descriptions of the network.

For the general LAN internetwork, he says SoftBench is right on the money. "You do a simulation, put the system together, watch it with [a protocol analyzer], and the results are real," Stephenson says. "If anything, SoftBench is a little conservative. Its worst case was usually worse than the reality ever was."

> Net managers never see traffic, so they don't see the problem.
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> ▲▲▲

Norm Sash, a LAN systems analyst at Boeing Computer Services Co. in Seattle, uses SoftBench and LANSIM to respond to users' complaints about slow-running applications. He creates what-if scenarios to compare to actual results and then determines if the network is underperforming or if the user's perception of slowness is caused by some other factor.

Like most net managers, Sash characterizes much of his work as playing catch-up. He expects that as Boeing Computer Services moves more mission-critical applications onto the network, the use of simulation and modeling tools for planning will increase.

Sash says he would use LANSIM more often but doesn't always have the time to collect the data it requires, such as performance measurements.

Simulation products such as LANSIM, BONeS and NeTool, he claims, are too complicated and lose their focus on the overall objective. Sash says that, instead of engineering tools, he needs a simple tool for Boeing Computer Services' network administrators to take to the field. SoftBench comes close to this simpler ideal, and he would use it rather than LANSIM if it had more features.

Hughes Aircraft's Rosich says he would like a simple tool for analysis of net performance. A quick and dirty simulator that would take between one day and one week to set up and run would let him cull 75% of initial design ideas, providing a clear-cut sense of the workability of a design.

With such a tool, he says, "I could ask if this design is so bad that it requires redesign or so good that I should do detailed simulation in BONeS.

"There is a silent crisis in data communications systems, and simulators make visible what is going on," Rosich says. Network managers never see communications traffic, so they don't see the problem. There is garbage on the network because no one really knows what's there."

Rosich points to the widespread use of the Transmission Control Protocol/Internet Protocol, which is robust and practically fail-safe but loaded with subtle implementation differences from one vendor to the next.

"It will keep going, but performance will be degraded," Rosich says, because TCP/IP was optimized for interconnections between a wide range of systems, not for performance.

Rosich and others who work with large, complex networks need little convincing of the value of modeling and simulation tools. But most net designers and managers see things they can do to fine-tune network performance before they use simulation tools.

One of those is Sam Barone, manager of the technical center at SunAmerica Financial, Inc. in San Francisco. Although vendors say Barone's state-of-the-art, image-based network is the type that will require design and management tools, Barone says he doesn't feel a need for them yet.

The company, which sells financial annuities, scans every incoming document into a 770G-byte optical storage jukebox. No documents or folders on clients are kept; all information is called up on a screen.

Designed 18 months ago from scratch, the network of 11 token-ring LANs supports about 400 people and 500 PCs. Approximately 140 people are image users, while another 260 nonimage users connect to an IBM ES9000 mainframe in Atlanta via a T-1 circuit. The system is continually expanding, and all departments will eventually be image-based.

Despite the pace, Barone says he believes he can fine-tune network performance by breaking up token rings or making larger packets rather than turning to a simulation tool. If the network should suddenly grow more complex — such as through an acquisition — a rethinking of the network would motivate him to acquire design tools.

One benefit Barone sees in using a simulation tool for network planning is that it would provide documentation to justify network upgrades to upper management.

But it's often tough to justify purchasing a tool when network managers trying to sort through the morass of new technologies find it difficult to use them. This difficulty is compounded by the fact that simulation models are intangible and abstract.

"Most users can deal with a device more than a model," Rosich says. "[The model] is an abstraction, not a box to touch or cable to plug in. If users can't deal with hardware, they can't deal with an abstraction of the hardware."

No time or money

Many LAN managers are not adequately trained or do not have the budget to run the increasingly complex networks for which they are responsible, let alone learn how to use design and optimization tools, Stephenson says. Instead, they spend much of their time putting out fires.

If the information management structure is to be treated as a strategic corporate resource, Stephenson contends, then talent should be supported at every level. "Let's finish the job and get them some training," he says.

If properly trained, network managers can offset the cost of buying a simulation tool by coming up with network designs that avoid downtime.

Stephenson cites a study from Infonetics Research, Inc. showing that the typical Fortune 500 company's campus network is down twice a month for an average of 4.9 hours each time, causing the company about $3.5 million a year in lost productivity.

Simulation could be used to project needs and ensure that new equipment gets into the budget, Stephenson says. Otherwise, managers risk not having money in the budget to buy equipment before performance degrades.

For the near term, the use of modeling and simulation seems limited to managers of large, heterogeneous networks or systems integrators who plan networks for customers.

But two trends point to their eventual broader use.

Vendors are working to simplify their tools by adding graphical user interfaces and developing modules that enable users to assemble tools precisely matching their own networks.

In addition, as smaller networks grow in size, complexity and strategic value, and changes to those networks become more frequent, users will seek simple, inexpensive tools to optimize countless tactical decisions.

Making better choices in those decisions is partly a matter of having more information. For this reason, modeling and simulation can bring more certainty to an uncertain outcome.

Why use modeling and simulation?

When would a network designer or manager use modeling and simulation?

- When they want to maximize existing network resources. Many networks weren't really designed but were thrown together from collections of networks that were already there. Now somebody has to figure out how to make that whole setup work.
- When they want to plan for changes, such as adding users or applications to the network. Predicting the impact of that growth can result in quick and painless implementations.
- When they want to support budget requests. Network changes often require cost-justification for approval at the next higher level of management to get them into the budget. Reports and graphics generated by modeling and simulation tools could help in this process.

In short, the "best guess" method of planning and implementing network changes soon will no longer do, consultants say. Rather, net designers and managers must learn newer, more precise ways to establish baselines for performance, measure reality and predict the effects of increased traffic on their nets.

Simulation tools can help network professionals in several ways.

Colin Mick, technical manager for Comdisco Systems, Inc.'s Block Oriented Network Simulator tool, offers this list of simulation applications.

- Compare network component alternatives, such as bridges vs. routers.
- Compare network design alternatives.
- Plan for changing capacity requirements.
- Predict performance before trying or buying components.
- Build network survivability scenarios.
- Generate configuration and performance specifications for procurements.

— Patricia Cope

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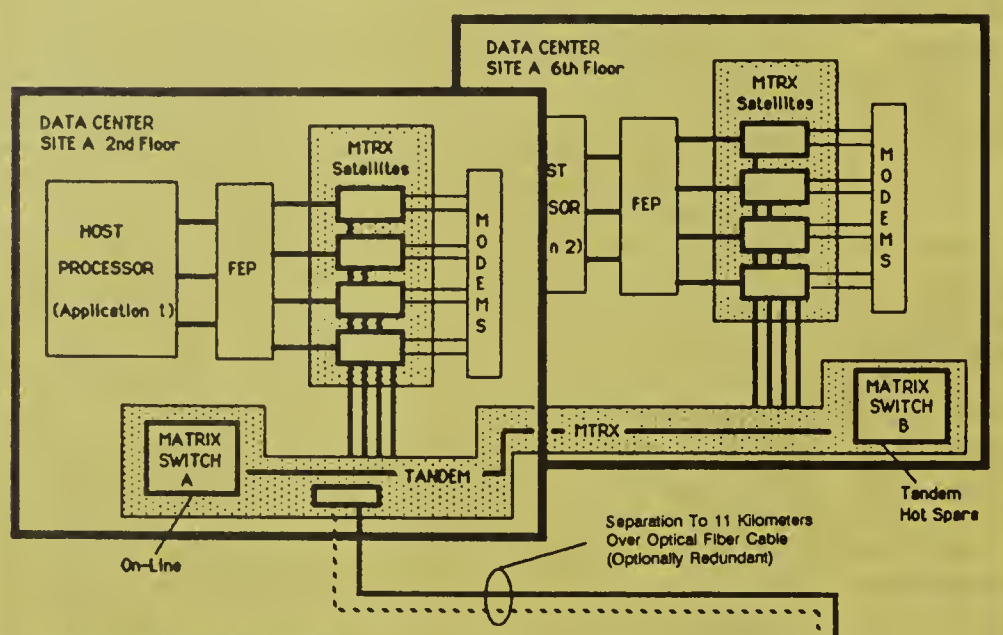

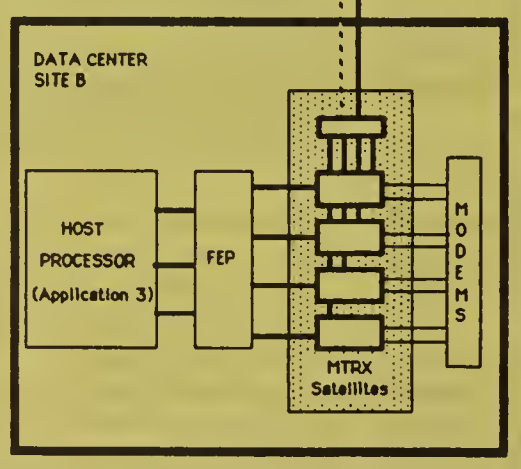

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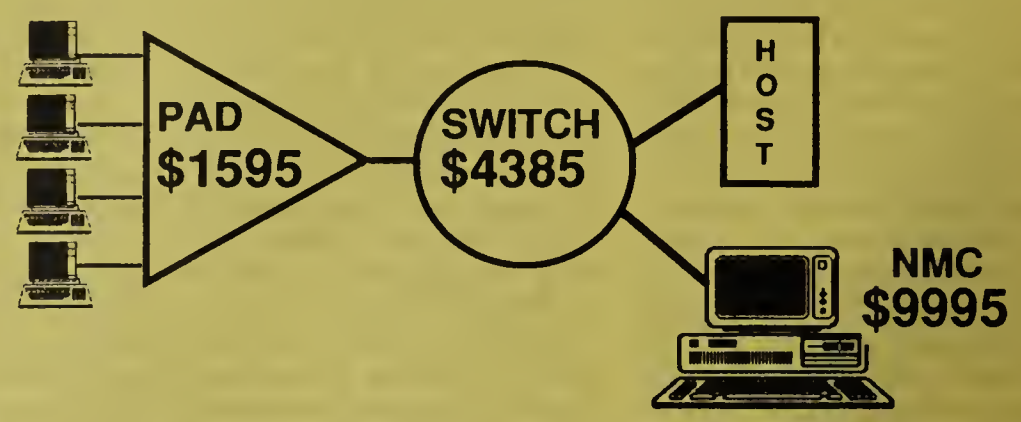

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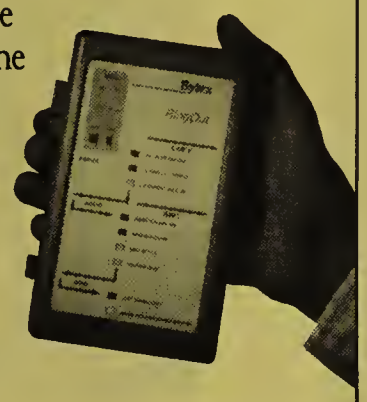

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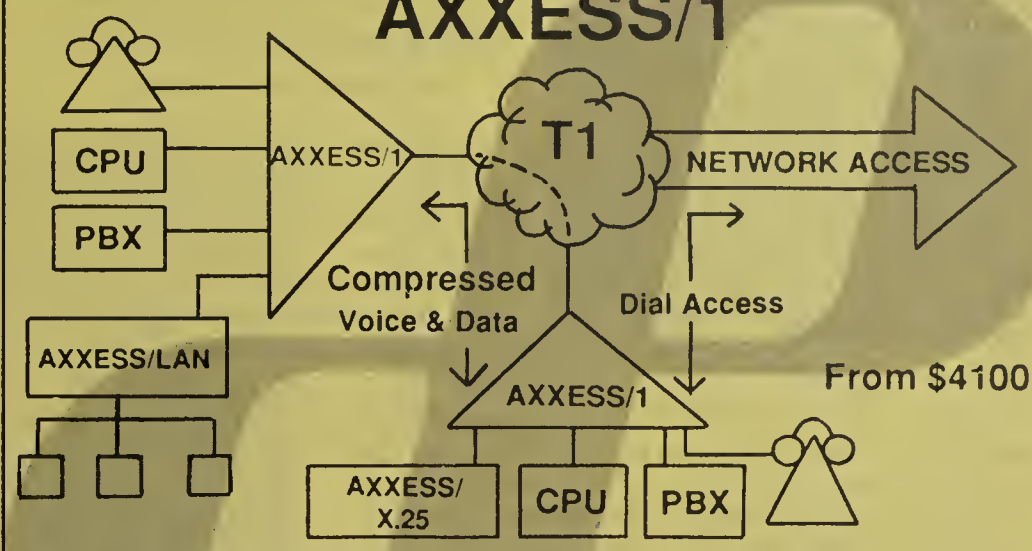

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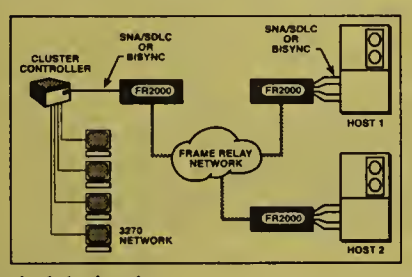

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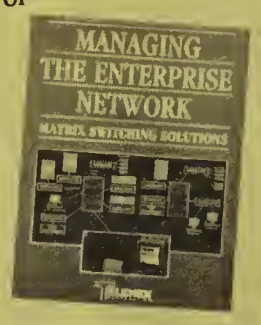

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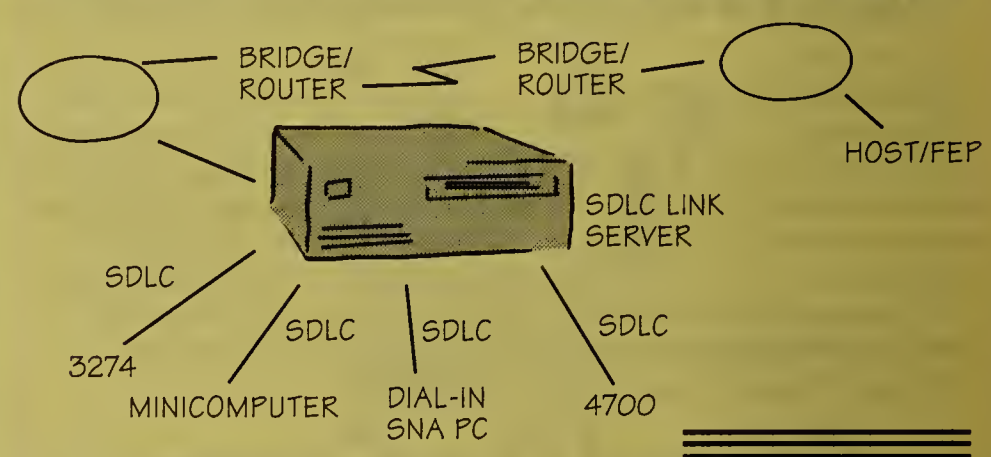

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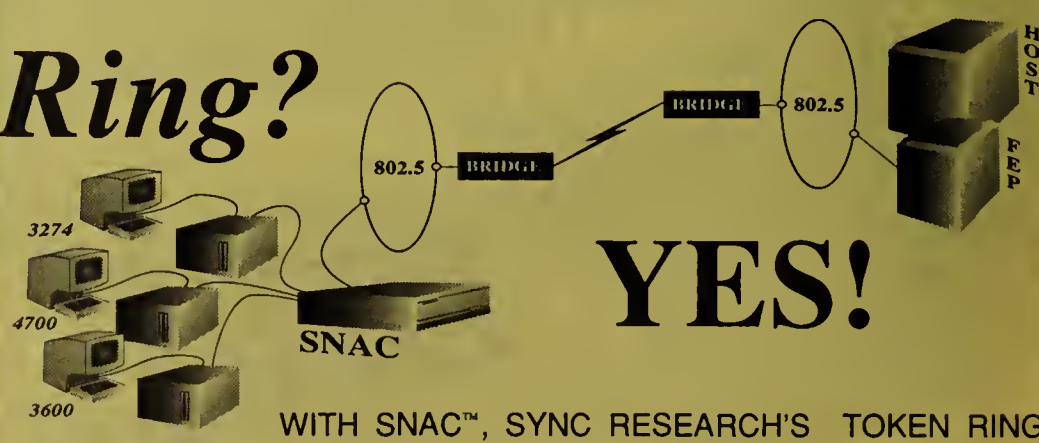

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Jan 27 (Jan 15 Close); Topic: Special/Supplement, Applications; 1. Annual Salary Survey, 2. LAN management supplement, Buyer's Guide: Videoconference equipment; Show Distribution: ComNet East; Lead Service

Feb 3 (Jan 22 Close); Topic: Internetworking; Buyer's Guide: Frame relay

Feb 10 (Jan 29 Close); Topic: LAN; 1. Networking Windows 2. LAN management; Show Distribution: NetWorld Boston; Lead Service

Feb 17 (Feb 5 Close); Topic: Internetworking; Guide To Strategic Purchase Decisions: Outsourcing

Feb 24 (Feb 12 Close); Topic: WAN; ACD options; Lead Service

Mar 2 (Feb 19 Close); Topic: LAN; Buyer's Guide: LAN E-mail (X.400 and otherwise)

Mar 9 (Feb 26 Close); Topic: Global Networks; Selecting an international hub; Show Distribution: DCI Downsizing/Cebit; Lead Service

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Novell offers LAN tool

continued from page 1

the software supports NetWare clients running OS/2 2.0.

The second component is the NetWare Management Map, which is the most important aspect of the announcement, according to analysts. The software, based on IBM's OS/2 Presentation Manager, resides on a dedicated NetWare node positioned as a net management console. It enables the LAN administrator to build a network map and oversee activity on one or more NetWare LANs.

The application collects network information through an agent that resides within every NetWare node's Internetwork Packet Exchange (IPX) protocol stack, according to John Edwards, director of marketing for Novell's NetWare Systems Group.

"In every IPX protocol stack, there is a built-in diagnostic agent — the IPX Diagnostic Responder," he said. The NetWare Management Map software continuously polls these agents to generate a network map and update network inventory.

According to Edwards, the application provides three key benefits: automatic node discovery, fault management and configuration management.

With automatic node discovery, once the software automatically broadcasts a discovery message across the LAN, it is loaded onto an OS/2 workstation on the NetWare net.

Based on the responses, it builds a logical graphical view of the nodes, cable segments, routers and bridges on the net. The application even discovers such things as T-1 lines and X.25 links.

The administrator can zoom in on any network segment or node to obtain a detailed report on local activity. The net manager can, for instance, find out which version of DOS is installed on a particular node or which transport protocol that node is using. The software will even let a LAN administrator obtain diagnostic and statistical information about the LAN card installed, such as its level of cache buffer hits.

In the fault management category, NetWare Management Map continuously monitors the network and provides node status through a color-coded map. If a network node goes down, for instance, its icon could turn red on the LAN administrator's map, indicating a changing condition.

The application will also let the net manager perform point-to-point tests between two nodes to check cable status.

The software provides inventory and configuration management features. During discovery mode, it stores all data on local and remote nodes in a Novell Btrieve database. Users can later add info on each node, providing a complete inventory of hardware and software used on the network as well as maintaining network configuration data.

New OS/2 requester

Novell's NetWare Requester for OS/2 2.0 now supports client workstations running OS/2 2.0, giving those devices full access to NetWare services. Previously, the NetWare Requester supported only workstations running OS/2 1.3.

Other enhancements include an increase from 255 to 1,000 in the number of Named Pipes sessions supported. Analysts said support for OS/2 2.0 was not a surprise.

The entire package will cost $200 per customer site. According to IBM, it will become available in March, when OS/2 2.0 is released. The product will be sold by IBM beginning in April.

BOC readies switch upgrade

continued from page 4

Kansas, Missouri, Oklahoma and Texas. The contract is the largest the switch maker has received from Southwestern Bell Telephone.

"Today, we have Northern Telecom switches with various vintage processors and software releases," Signagio said. "We wanted a common platform that would enable us to quickly and easily offer new services across all switches."

Jeff Sobeck, sales director for Northern Telecom's Southwest group, said the upgrade will more than double the busy-hour call handling capability of the switch from 100,000 calls to about 220,000. The faster processor would enable the switch to support services that require far more power than regular phone service. Some existing DMS-100 switches can support certain advanced services but only on a limited basis, he said.

Southwestern Bell Telephone will not be able to roll out advanced services across all its central office switches.

The BOC uses switches made by AT&T Network Systems group — its top switch provider — and Ericsson Corp.

IBM board to support E-net

continued from page 2

or MCA bus microcomputer and provide separate connections to a Token-Ring and Ethernet LAN. While the board will provide two physical connections, analysts said it will only support one active connection at a time.

The board will be an interim solution to having Token-Ring and Ethernet components embedded directly on an IBM Personal Computer's motherboard.

"This will be short-lived since boards doing that typically last less than one year," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "Chips and Technologies [Inc.] proved you could [support token ring and Ethernet] on a chip, and you can put it right on the motherboard."

The IBM spokeswoman said it would be premature for IBM to unveil a multifunction LAN adapter in February.

But analysts said IBM, long a proponent and developer of token-ring technology, is also looking to gain Ethernet market share since that market is growing at more than twice the rate of the token-ring market. U.S. shipments of Ethernet cards last year accounted for 1.9 million units, compared to 800,000 for token ring, according to market researcher Dataquest, Inc.

Dataquest projects shipments of Ethernet cards in the U.S. will reach 2.8 million this year, compared to 1.2 million token-ring adapters. It also projects that 5.5 million Ethernet boards will ship in the U.S. in 1995, compared to 2.7 million token-ring cards.

IBM is also expected in February to license its 4M and 16M bit/sec Token-Ring chip technology to National Semiconductor. Currently, IBM offers the chips with its own adapters only, but National Semiconductor will make its own Token-Ring chips for sale to other vendors.

Richard Brand, strategic marketing manager for the Local Area Networks Division in National Semiconductor's Communications and Computing Group, declined to comment on the IBM licensing arrangement reports.

Analysts, however, said IBM is looking to take advantage of indirect distribution channels to increase revenue.

"IBM's just looking to have alternate suppliers" of its Token-Ring technology, Dzubeck said. "IBM does good [very large-scale integration] so they'll license the technology."

Frank Michnoff, an analyst with the META Group in Westport, Conn., said IBM's chip technology is near the forefront of the industry. "They have an edge that they can exploit," he said.

Brand declined to say whether IBM would use National Semiconductor's Ethernet chips on the dual-media board. IBM currently resells Ethernet boards from 3Com Corp. for use in its RISC System/6000 workstations.

Those boards currently use the National Semiconductor Ethernet chips.

Firms roll out E-net modules

continued from page 4

FOMIM hub modules via single-mode fiber cabling.

Pricing for the fiber modules is $5,250 for the FOMIM-36, $9,600 for the FOMIM-32 and $14,400 for the FOMIM-38. The FOT-F3 is priced at $900.

In addition, SynOptics announced two Ethernet host modules for its intelligent hubs that will enable users to run Ethernet over a wider variety of existing coaxial cable.

The Model 3301-75 and 3301-93 are designed to support Ethernet over 75- and 93-ohm coaxial cable, respectively, and can be used in either the firm's System 3000 Premises or Model 3030 Department Concentrators.

The 3301-93 module is designed to support coaxial cabling used in IBM 3270 and Arcnet environments, while the 3301-75 unit is better suited for wiring cable television and Wang Laboratories, Inc. Wangnet installations. Both units are comparably priced to SynOptics' 3301 module, which only supports RG58 50-ohm coaxial cable.

Users currently employing 75- or 93-ohm wiring can now use either the 3301-75 or 3301-93 modules to support 10Base2 Ethernets without replacing existing coaxial cable. Point-to-point links of up to 100 meters are supported.

Both modules will be available within 60 days and cost $1,795 each.

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Teletoons presents A Network Christmas Carol

CHRISTMAS EVE.. THE CITY'S OFFICE WORKERS ARE LEAVING EARLY, SAVE FOR ONE...

HOW COULD IT BE? SOME ONE STILL WORKING AT THIS HOUR, THIS SPECIAL NIGHT?

Ralph.. we're leaving for the office party.. You coming?

Bah, Humbug! Who cares?

Ralph Scrooge NETWORK MGR.

BUT IS RALPH REALLY GOING TO BE ALONE TONIGHT?

Useless partygoers! I'm the only one around here interested in keeping network costs down..

CREEEE

WHA... WHO'S THAT?

It's me.. Ed Marley.. In life I was on your planning team, Ralph...

Marley!! but.. you were phased out in the merger of '88..!!

Yes, Ralph.. but I still carry my networking sins OOOOOO..

SINS? BUT NOBODY COULD SAVE A BUCK LIKE YOU.. WE STILL USE YOUR OLD NETWORK!

Those low-speed analog lines? OOOOOO the pain.. the pain

POOF!

RALPH STAGGERS TO HIS DESK, REACHES FOR HIS ANTACID TABLETS, BUT THERE WILL BE NO PEACE TONIGHT!

AAAGH! WHO ARE YOU?

HEY, RALPHIE.. C'est moi.. the spirit of networking present..

No... No... Where are you taking me?

Just back a few hours in time... through this wall... to the office party you missed..

Ralph's a Renaissance man, alright.. he runs a 16th century network!!

MERRY

HA...HA.. HA..H4.. HA..HA..

Oh yeah!! Well.. just wait until **your** review comes up!!

They can't hear you.. they're in another world.. dreaming of modern telecommunications.. Uh, oh.. time's up..

POOF!

Not ANOTHER one! Who are you? What is this dump?

It's your future, Ralph. you run a 900 service for lonely cab drivers using mobile phones.. Look! You've got calls on lines 2, 6, 7, 8, 19, 24 and 47... hee, hee

NO..NO!! I'LL CHANGE! I'LL CHANGE!

We'll also be changing over to PCs and LANs, with frame relay.... ..and SMDS of course.

Bless us One and all!!

AND HENCEFORTH IT WAS SAID OF HIM THAT NO ONE NETWORKED BETTER.

THE END!

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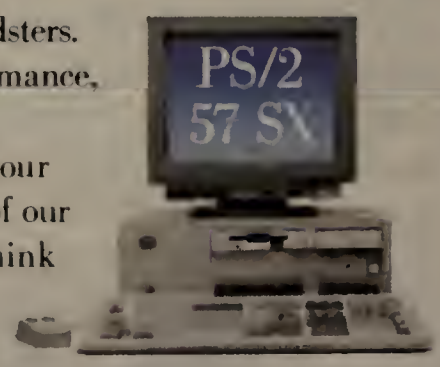

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